

FRIDAY, JUNE 19, 1896.

## CONTENTS

ILLUSTRATIONS:	PAGE.		PAGE.
New Eight-Wheel Locomotive of the Boston & Maine.....	425	Bridge Building.....	440
200 Horse-Power Baldwin Westinghouse Electric Mine Locomotive.....	428	Railroad Law.....	440
The New Atlantic City Engines of the Philadelphia & Reading.....	429	Meetings and Announcements.....	441
The Master Car Builders' Convention.....	430	Personals.....	442
EDITORIALS:		Elections and Appointments.....	442
The Work of the Brake Shoe Test Committee..	434	Railroad Construction.....	442
EDITORIAL NOTES.....	434, 436	Electric Railroad Construction.....	443
TRADE CATALOGUES:		General Railroad News.....	443
Vaulain System of Compound Locomotives....	436	Electric Railroad News.....	444
GENERAL NEWS:		Traffic.....	444
Locomotive Building .....	440	MISCELLANEOUS:	
Car Building.....	440	Technical.....	439
		The Scrap Heap.....	440
		Car Accountants' Annual Meeting.....	425
		Comparative Efficiency of Pintch and City Gas.....	428
		Annual Meeting of National Freight Agents' Association.....	429
		Table of Averages of Results of Laboratory Tests of Brake Shoes.....	429

## Car Accountants' Annual Meeting.

The twenty-first annual meeting of the International Association of Car Accountants was held at Cleveland, O., June 8 and 9. The international character of the organization at the attainment of its majority was emphasized by the fact that the President for this year was Mr. James Osborne, former Superintendent of Car Service of the Canadian Pacific, but recently promoted to the position of assistant to the Second Vice-President of that road. The attendance was large, about 150 delegates having seats on the floor.

The flight of 21 years opened the way for marking the anniversary as a celebration by some pleasant incidents, which were a little out of the ordinary line. Three of the members, Frank M. Luce, Chicago & Northwestern; C. P. Chesebro, Wabash, and C. W. Cushman, Buffalo Car Service Bureau, were the distinguished members of the occasion by reason of the fact that they were the only ones who had attended every meeting since the organization, 21 years ago. Mr. H. G. Sleight, of the Vandalia line, had attended every meeting except one. All four of these Nestors still keep the positions which they represented in the organization at the beginning.

The Mayor of Cleveland welcomed the association to that city, and Mr. Luce responded in an address which eloquently reviewed the vicissitudes of the past, making an interesting reference to some of the great reforms in car-service methods which had been accomplished through the aggregate effort and discussion of the association at its 21 meetings. The Treasurer's report showed that the membership of the association had grown from some thirty members at the first meeting to nearly two hundred.

The most significant incident of the entire meeting was decidedly interesting and emphatic. The Car Accountants are the men who have done more than any other association of railroad men to promote discussion of a better system of car-service accounts than that which now prevails, usually taking the ground that the per diem system is the right theory. The annual discussions of this subject have led to the reading of many papers designed to encourage the honest and full payment of mileage on foreign cars. When it has been discovered in the past that certain railroads had, to use the technical expression, "cut" their mileage, the presentation of the claims of those who have suffered on this score has invariably been investigated by the higher officers, and in every case it is believed that a quick and full reparation has been made, accompanied by the discharge of the official who had adopted so extreme a method of "economy." During the past year, however, every car accountant belonging to the association was made aware of the most extraordinary alleged shortage of mileage which has ever occurred in the history of American railroads. Requests were made by many of the highest officials for the usual investigation of the books of the suspected road, but for the first time restitution was refused, refuge being taken behind the statement that the books in question were not public property and should not be opened. In this unsettled condition of the allegation it will be readily understood that the entire association was astounded when the car accountant who refused to submit his accounts to examination rose to read a paper for the edification of his fellow members. Before a word was said one member after another arose and left the room, in a perfectly decorous manner, until nearly a hundred had made their exit, as a protest against "sealed books." It was a most dramatic, yet wholly spontaneous, demand for honest mileage, and its argument was more powerful than the logic of a hundred papers on the subject could be. No man who witnessed it will ever forget its lesson.

The report of the Committee on Car Service was in line with the action recently taken by many of the rail-

roads looking to the re-classification of all cars, both private and other, which have heretofore been carried in the equipment lists as refrigerator cars. It has been found that a great many cars which are painted and marked in the style of refrigerators are of antiquated pattern, many of them having no iceboxes, so that they are unfit for any other service than that of common box cars. The difference in the rates of car mileage as between box and refrigerator cars has led the railroads to demand that these refrigerator cars should be overhauled, and that such of them as are not thoroughly well adapted to the carriage of refrigerator car freight shall receive the lower rate of mileage. The representatives of the private car lines in the association objected to this demand for re-classification, but the railroad men were inexorable, and steps will be taken by all of them to have the official statements of this refrigerator equipment make a clear distinction in the matter of the rates to which such cars may be properly entitled. The car service committee further recommended that cars should be numbered in uniform series, in order to secure better handling and distribution, and suggested that the efficiency of car records would be promoted by having line marks eliminated from cars that belong to railroads. The per diem theory did not provoke as much discussion at this meeting as it usually does, but the interest of the members was none the less intense. The per diem question has largely passed beyond the car accountants, but they did not let the opportunity go by without presenting some of the well-known arguments for substituting the per diem plan for the present method of settling car hire, which can easily be made dishonest by any man who chooses to do so.

The car service committee reported that it had made a thorough examination of the various methods of car sealing and of keeping car-seal records throughout the country. The real purpose of the car seal is to afford a record, but there are only a few roads that keep a seal record other than that kept indifferently and spasmodically by agents, yard-masters and conductors, and these records are not subject to any check or supervision; often they are not continuous, and valuable time is lost in the attempt to make them available when wanted. The committee, therefore, suggested that the association recommend to its members the keeping in the car record office of each road a complete, continuous and permanent seal record, the details of which are to be developed after further experience.

The Committee on Office Methods had made a careful examination of the various car record, mileage and other blanks used in car-record offices, and they found that, while there were some minor variations, there is a sufficient uniformity to show that most of the car-record offices in the country are working upon one general system. They suggested, however, that three colors be used for car tracing blanks, the first to be white, for the ordinary tracer; the second to be on blue paper, to denote that such tracer is to follow the cars, and the third to be read as a "danger signal," giving notice to the recipient that all cars contained upon it have been absent over 90 days. The discussion developed that the red card, or "danger signal," for old cars, may be adopted on some roads, but it is not probable that the proposed blue tracer will meet with much favor.

Mr. W. E. Beecham, Chicago, Milwaukee & St. Paul, read a valuable paper on the distribution and handling of foreign equipment. Mr. Beecham showed by quotations from recent correspondence that the best way for a road to secure good treatment for its own cars is to act with entire fairness in using foreign cars. Several examples were reported where cars had been loaded more than one hundred miles in a direction opposite to the home route, when an empty haul of possibly ten miles would have started the car on its direct road home, and it was thought that a short empty haul was preferable to a long loaded one under such circumstances.

By far the most important subject that came before the meeting was the report of the committee on minimum weights in the official classification as related to the capacity of cars. This subject had been introduced a year before in a paper by Mr. Church, of the Pennsylvania lines, showing the inequality between the carrying capacity of cars and the minimum loading rates provided in the official classification.

A committee has been appointed, consisting of Mr. C. H. Bieber (Michigan Central), Mr. Church and Mr. Luce, and they have secured the adoption of united action by the Eastern Classification Committee and the Western Traffic Associations looking to a reduction in the minimum weights, so as to make them more nearly in accordance with the carrying capacity of the cars. The report of this committee was published in the *Railroad Gazette* of June 12, page 405.

The proposition of the Eastern lines to use cubic capacity as a standard seems to be impracticable, and the matter has now been referred back to Mr. Gill's committee for further consideration. The committee promised to keep up the fight against the inequalities of the present minimum weights so that they would be brought within a closer relation to the capacity of cars, and do away forever with the necessity of building "furniture" cars for the purpose of manipulating rates.

Mr. T. S. Bell, of the Pennsylvania Railroad, read an interesting paper explaining how the road managed to weigh 98 per cent. of its 70,000 cars every year and stencil the light weight of each car. This great accomplishment seemed to surprise many of the members, most of

whom weigh their cars at intervals of from one to six years. Many of them announced their intention of returning home to take up the question of more frequent light weighing.

The committee on arbitration had settled one case, the only one that was referred to it during the year. The question was on the use of a furniture car owned by one railroad and used by another to carry an elephant around the country with a circus all summer. No mileage was paid to the owners of the furniture car either by the railroad or by the elephant's manager, and the committee on arbitration decided that the railroad which had permitted it to be so used was responsible for the mileage, and they furthermore expressed a strong opinion against the diversion of cars under such circumstances.

At the conclusion of the meeting Mr. Osborne, the retiring President, announced his resignation from the association, as his promotion had taken him beyond the paths followed by the Car Accountants, and Mr. William McKay, of the Southern Pacific, was elected to succeed him. Mr. John J. Merrill, of the Chicago, Burlington & Northern, was elected Vice-President, and Mr. J. M. Daly, of the Illinois Central, received the election to the vacancy on the executive committee. This meeting was a very useful one. The members displayed a great deal of interest in all the proceedings, and entered into their discussion with intelligent zeal.

## New Eight-Wheeled Locomotive of the Boston &amp; Maine.

[WITH AN INSET.]

The Boston & Maine Railroad has recently put into service a number of eight-wheeled locomotives, designed by Mr. Henry Bartlett, Superintendent of Motive Power and built by the Rhode Island Locomotive Works. As these engines have some peculiar features, and are doing very satisfactory work, we illustrate one type of them very completely.

In designing these engines an attempt has been made to utilize as many of the standard parts adopted by the road as possible, so as to lessen the number of pieces carried in stock. A rather novel innovation has been made by adapting these engines for two classes of passenger service and for freight, while keeping all of the constructional details unchanged. Thus the two types for passenger service differ only in the diameter of driving wheels, these being 72 in. and 68 in. respectively. The freight engines differ from the passenger in the diameters of the drivers and the stroke of the pistons. In these the driver diameter is 62 in. and the piston stroke 26 in., while in the passenger engines the stroke is 24 in., the cylinder diameter being 19 in. in all. The same cylinder castings are used for all three classes of engines, the difference in the stroke being made by setting the heads of the passenger engines 1 in. farther into the cylinder than is done with the freight.

The appearance of these locomotives is well shown by the half-tone reproduction of a photograph, while the arrangement of the parts and the general features of their construction can be clearly seen in the side elevation and sections shown on the inset. Further particulars are given below:

## General Dimensions.

Fuel.....	Bituminous coal
Gage of road.....	4 ft. 8 1/2 in.
Total weight of locomotive.....	125,000 lbs.
on driving wheels.....	81,000 lbs.
wheel base.....	24 ft. 1 in.
Rigid ".....	9 ft.
Truck ".....	5 ft. 10 in.
Distance center of main driving wheels to center of cylinders.....	12 ft. 2 in.
Length of connecting rod, center to center.....	8 ft. 1 1/2 in.
Transverse distance center to center of cylinders.....	6 ft. 6 in.

## Cylinders, Valves, etc.

Diameter of cylinder.....	19 in.
Stroke of piston.....	24 in.
Kind of piston packing.....	Bull ring and two 1/4 in. packing rings
" piston-rod packing.....	U. S. metallic
Size of steam ports.....	1 1/4 in. x 18 in.
" exhaust ".....	1 1/4 in. x 18 in.
Greatest travel of valve.....	5 1/2 in.
Kind of slide valve.....	Richardson balanced
Outside lap of valve.....	1 in.
Valve inside, front.....	Line and line
" back ".....	1/2 in. clearance
Lead of valve in full stroke.....	1/2 in.
" at 8 in. cut-off.....	1/2 in.

## Wheels, etc.

Diameter of driving wheels outside tires.....	6 ft.
" truck ".....	2 ft. 9 in.
" driving axle journals.....	3 in.
Length " truck ".....	10 in.
Diameter of " ".....	5 1/2 in.
Length " ".....	10 in.
Diameter of main crank-pin.....	5 1/2 in.
Length " ".....	5 in.
Diameter of side-rod ".....	1 1/2 in.
Length " ".....	4 in.
Length of driving spring, center to center of hangers.....	3 ft. 8 in.

## Boiler.

Kind of boiler.....	Wagon top with radial stays
Inside diameter of smallest ring.....	5 ft.
Material.....	Steel
Thickness of plates in barrel.....	1 1/2 in.
Kind of horizontal seams.....	Butt joint inside and outside welt, hexuple riveted
Kind of circumferential seams.....	Double riveted
Material of tubes.....	Charcoal iron
Number " ".....	299
Diameter " " (outside).....	2 in.
Distance center to center of tubes.....	2 1/2 in.
Length of tubes.....	11 ft. 9 1/2 in.
" firebox.....	7 ft. 6 in.
Width " (top).....	5 ft. 1 in.
" (bottom).....	3 ft. 6 1/2 in.
Depth " (front).....	6 ft. 2 1/2 in.
" (back).....	5 ft. 7 1/2 in.
Water space (sides).....	3 1/2 in.
" (back).....	3 1/2 in.
" (front).....	4 in.
Thickness of plate outside of firebox.....	5/8 in.
" sides.....	3/4 in.



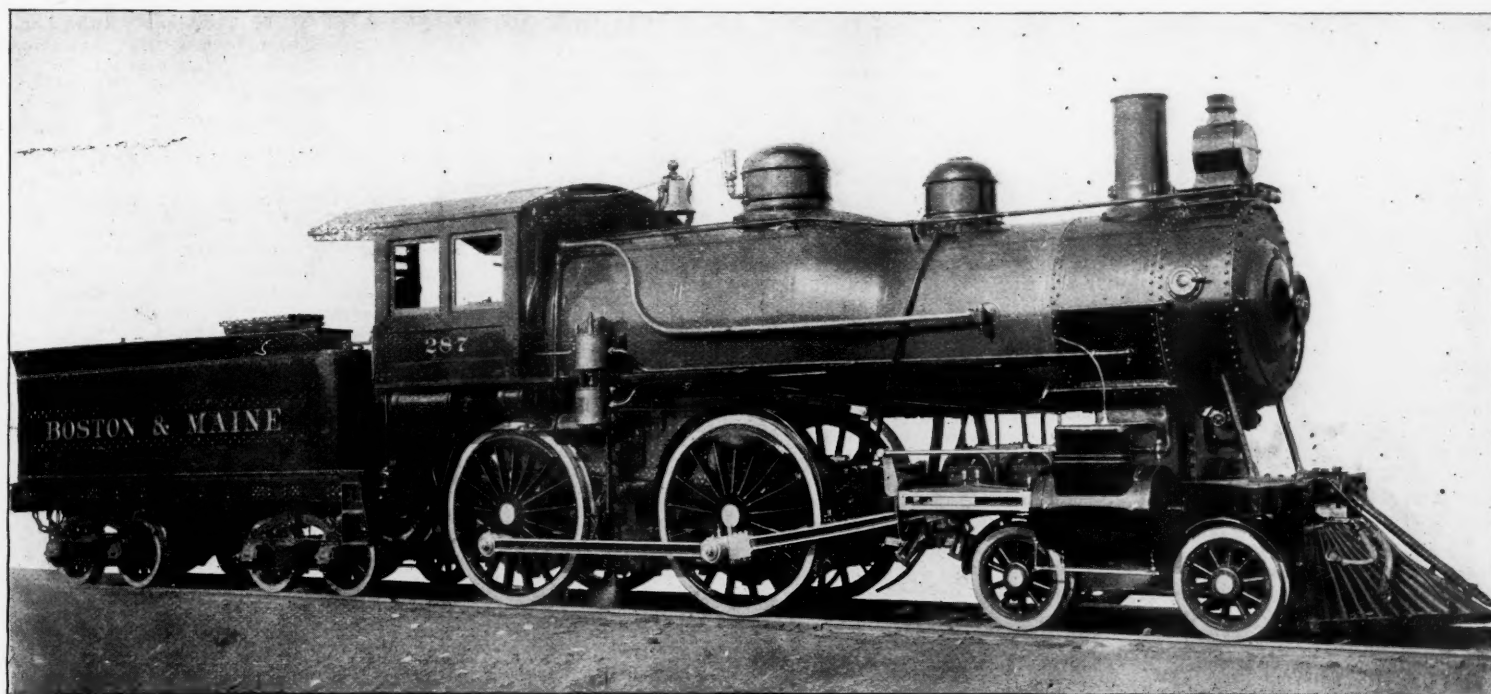


steam pouring out of *C*, and carrying with it the final mantle of gas that it picked up in the smokebox.

This action, simple and efficient as it may now seem, was not obtained in a day. There are cinders occasionally drawn through the tubes, and when these cinders are moving at high velocities, they possess great abrasive qualities. It has therefore been found to be necessary to

they are ground to dust against the sides and netting and have no body to carry fire when they at last escape into the air. And they do escape, for it has been found unnecessary to ever spark these front ends, since there is nothing left to remove, not even a capful. The front doors need not be opened from one month's end to the other, and the spark traps at the bottom

able, and which we do not recollect having seen embodied in any other engine. There are but three holes in the front end for holding the diaphragm and netting, and these latter are kept in position by the clips that appear in the photograph and the bolt at the top. By fastening in this way these thin parts, which become heated to a much higher temperature than the shell, are



Express Passenger Locomotive—Boston & Maine Railroad.

Mr. H. BARTLETT, Superintendent Motive Power.

Built by RHODE ISLAND LOCOMOTIVE WORKS, Providence, R. I.

protect the interior of these pipes from such action, and in order to do this a perforated plate has been placed around and over the air apertures at the front and back. This obviated the difficulty to a great extent, but still some were drawn in until the plough-shaped deflector plate was placed back of the perforated plate and between it and the tubes. This killed the last vestige of a spark or cinder that could find its way into the air passages of the exhaust pipe. It will be readily understood that, as the sparks and cinders issue from the tubes at a high velocity, they strike against this deflector plate and are thrown out against the sides of the smokebox and their own momentum carries them out of the current of the draft into the front end. The device is thus made to act upon the same principle as a centrifugal dust separator, in which the momentum of the heavier particles of dust is made to carry them out of the air current to the point where it is desired that they shall be deposited. So here, while the solid matter is hurled forward into the front end of the smokebox, the lighter gases, with the less inertia, are drawn back through the perforated screens at the front and back and pass out of the stack while the cinders are still being churned to bits in the smokebox below.

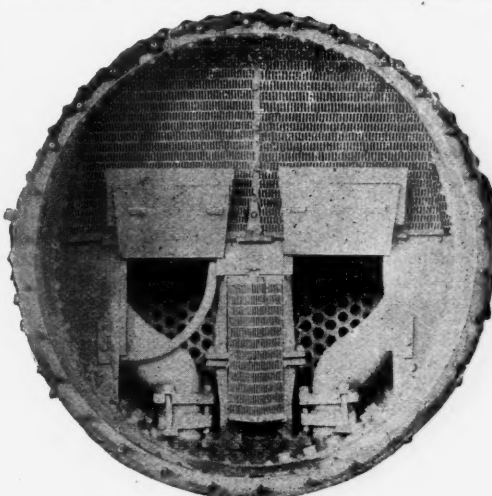
And this is exactly what does occur. A night's ride on one of these engines on a heavy train between Boston and Concord, New Hampshire, wherein the stack was carefully watched and on one stretch of 15 miles, at speeds ranging from 15 to 45 miles an hour, hauling a train of eight cars, there was nothing that came from the

have become a useless appendage and an unnecessary expense, that may as well be removed and probably will not be applied in the future where the Smith exhaust is used.

While speaking of this exhaust pipe it will be well to deal with the whole front end. The three half-tone re-

productions of photographs of the interior of the smokebox show the arrangement of the netting, diaphragms and exhaust-pipe as they appear from the front. Fig. A shows the front end as it appears with the engine ready for work, but with the front casting removed. The perforated plate is up in position and the diaphragm down. Attention is called to the adjustability of the doors of the diaphragm, which have their lower portions so arranged that they can be raised or lowered, thus increasing or diminishing the area beneath. Fig. B shows the same front end with the diaphragm doors opened for the inspection of the tubes or such other work as may need attention. Fig. C shows the perforated plate lowered, exposing the petticoat pipe and the top of the exhaust nozzle, giving access to these parts, as well as to the steam pipes and blower.

The details of the construction of the front end are shown in the front and side elevations. From this it will be seen that there is ample space behind the exhaust for the inclined deflector plate and the reader will also be able to grasp more thoroughly the action of the cinders and sparks. As they leave the tubes and are thrown out to the sides of the smokebox those issuing from the upper rows of tubes strike the diaphragm in front of the nozzle and are thrown down to the bottom of the smokebox, are caught in the current coming from the lower rows of tubes and blown to the front, where they begin the whirling and grinding that results in their pulverization and reduction to such a size that they can pass through the netting and be perfectly harmless.



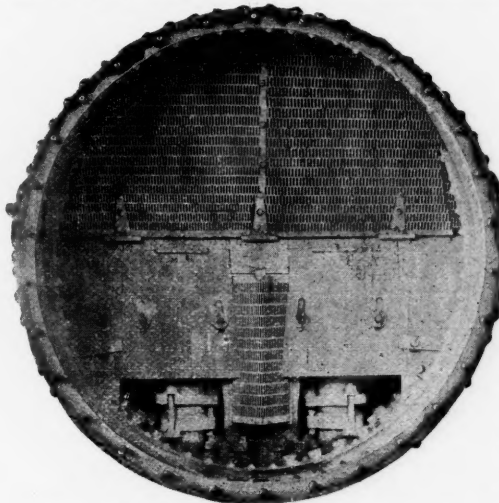
Front End Boston & Maine Locomotive—Fig. B.

There is a feature about this front end that is valuable, and which we do not recollect having seen embodied in any other engine. There are but three holes in the front end for holding the diaphragm and netting, and these latter are kept in position by the clips that appear in the photograph and the bolt at the top. By fastening in this way these thin parts, which become heated to a much higher temperature than the shell, are

permitted to expand freely, with the result that they are not warped and distorted so as to leak and become troublesome. It is also a much simpler way than the usual methods in that almost no fitting is required, and the sheets for a lot of engines can be cut from templates, as was done in this case—a method which we believe to be quite unusual.

At the other end of the boiler there is a brick arch whose application is so well arranged that some may be disposed to copy it. The brick are slightly arched, and are carried on wrought iron supports that are screwed into the sidesheets. The brick are notched out to set down over these supports, and the space between them and the sheet is filled with fire clay. No trouble is experienced with this method of holding, and the space of 18 in. between the top of the arch and the crown sheet has an area of about one and one-half times the sectional area of the tubes.

It was the privilege of a representative of this paper to ride on two of these engines a few weeks ago, and to watch their working very carefully. The first trip was on the morning express running from Boston to Portland. The train consisted of a baggage, a mail, an express and five day coaches, each mounted on four-wheeled trucks, and three heavy parlor cars, mounted on six-wheeled trucks, eleven cars in all, which were easily hauled with the lever hooked back to the second notch from the center, which corresponds to a cut-off of  $6\frac{1}{2}$  in. Almost immediately after pulling out of the Union Station the lever was hooked back to this point and the engine



Front End Boston & Maine Locomotive—Fig. A.

stack in the shape of sparks other than a few fine cinders, none of which shot upward like a rocket, but trailed back with the smoke and blackened before reaching the rear end of the tender, while, with the baffle plate *F* in place, even this insignificant display of pyrotechnics entirely disappears. The fact is the sparks and cinders are thrown into such a whirlwind in the smokebox that

worked there for the remainder of the run to Salem. The exhaust was remarkably soft and in marked contrast to that of an engine used on the return trip that had the ordinary exhaust pipe and which made the sharp sound with which we are all so familiar.

Front End Boston & Maine Locomotive—Fig. C.

A more interesting and extended ride, however, was made on an engine hauling the evening train from Bos-



ton to Concord, N. H. This train consisted of eight cars—a postal, an express, a baggage, four day coaches all equipped with four-wheeled trucks and one sleeping-car with six-wheeled trucks. It did not seem to be so much a matter of making steam as in keeping it from blowing off. The pointer ordinarily stood just below the 180-lb. mark, though it frequently passed it, and the safety valves would open. The furnace door was not closed during the whole run, being held open on the first latch, and the reverse lever was kept in the first notch from the center, corresponding to a cut-off of  $4\frac{1}{2}$  in. The fire was burned with remarkable evenness over the whole surface, and careful watching during the periods of firing and slicing failed to reveal anything but a uniform draft through the whole area. The brick arch gave the white color to the flame, and except at the moment of firing there was no smoke. The throttle was kept wide open. The coal used was very fine, there being hardly a single lump in the whole tankful, but it caked readily when wet, though it did not clinker, and, as we have already said, so effective were the devices used in the front end that there was no symptom of spark-throwing from Boston to Concord. On the return the next morning with nine cars the same working was repeated, with the exception that the throttle was not kept so widely open. The reason for this is that from Boston to Concord the grade is gently ascending for the whole distance, while, on the return, the train has the advantage of the descent.

In order that the apparent working of the engine might be demonstrated to be the actual working, indicator cards have been taken in connection with observations of the vacuum existing in the smokebox under the

Some particulars of that investigation will be found in our issue of May 1, page 306.

Mr. Brangs then takes up the matter of the value of the different gases and lamps for illumination. These tests were made in a passenger car fitted up for the purpose. The interior finish of the car is light, being natural oak. The Pintsch gas used was the regular product of the road taken from its service pipe lines at Hoboken. The city gas was got from the Pennsylvania Railroad Company at Jersey City and taken from the regular service pipe lines at the Pennsylvania station. The tanks were filled one to a pressure of 19½ atmospheres, the other to 19 atmospheres. The lamps tested were, for Pintsch gas the standard 4-flame with No. 40 tips, also the same lamp using only three burners with No. 80 tips, also the Pintsch argand lamp No. 1. For the city gas the Pennsylvania Railroad standard argand lamp for burning city gas was used, otherwise known as the Gordon-Mitchell.

The city gas was supplied to the lamps under a pressure of 21 lbs. per square inch in the pipe leading from the regulator to them, this being the practice. The "drop" of the 3 flame and 4-flame lamps was 24 in. from the ceiling. That of the argands was about 21½ in. The adjustment of all lamps for the consumption of gas is what would be obtained under normal conditions of train service. During the tests all light from without the car was entirely excluded.

Tests were made to determine the actual general illumination of the car by each system of lamps; also to determine the candle powers of each style of lamp used.

The tests for general illumination were two in number, given below as A and B. Test A was a new and

of city gas per hour; or Pintsch gas gave 3.5 times as much light per cubic foot as the city gas.

In the single lamp or candle power tests the second lamp was the one measured in each case, and readings were made at angles of 30, 45 and 60 deg. below the horizontal. The methods employed were those usually followed in tests of a similar character, and are explained in detail in tables. The results were as follows:

The D., L. & W. standard 4-flame lamp burned 3.4 cu. ft. of gas and gave 34 C. P. The same lamp with 3 No. 80 tips burned 3.74 cu. ft. and gave 49 C. P. The Pintsch argand No. 1 burned 3.55 cu. ft. and gave 48 C. P.

The city gas argands burned 8.3 cu. ft. an hour, and gave 23 C. P.

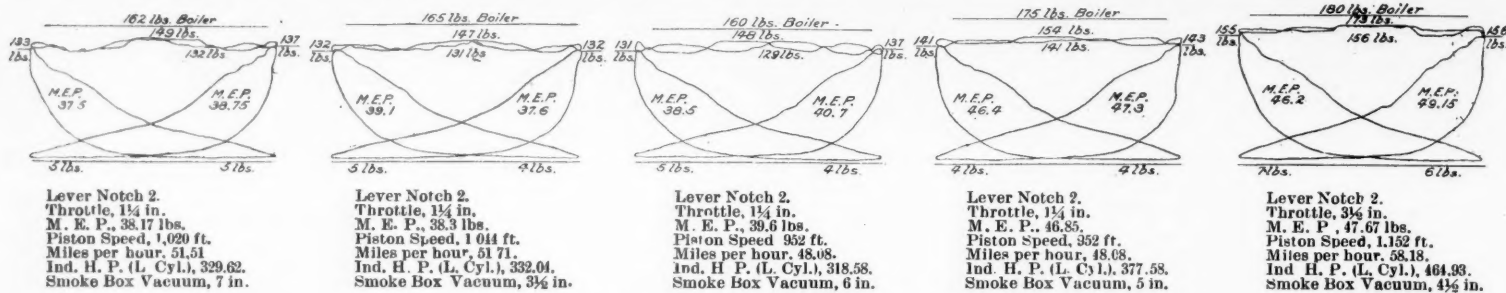
The average results of all tests showed the percentage of light per cubic foot of gas burned to be as follows:

	Percentage.
D., L. & W. 4-flame, Pintsch gas.....	73.3
lamp 3, No. 80 tips, Pintsch gas. ....	100.0
Pintsch argand, Pintsch gas.....	95.7
City gas argand, city gas .....	20.7

The highest relative efficiency of Pintsch gas as compared with city gas found by Mr. Brangs, as stated in detail above, was 5.04; that is, the Pintsch gas gave that many times as much light per cubic foot as the city gas. The lowest relative efficiency was 3.5. The ratios determined by Messrs. Denton and Chandler, as stated in the article to which we have referred above, were 1 to 3.44, 1 to 3.78 and 1 to 4.4.

Mr. Brangs makes the total cost of Jersey City gas compressed and supplied to the cars, \$2.745. Using his ratios of efficiency as given above this would be equivalent to Pintsch gas at from \$9.61 up to \$13.83.

Accompanying the report are a number of detailed tables which we do not reproduce as the results are



Indicator Cards from Boston & Maine Locomotive.

varying conditions of the working of these engines, both with and without the Smith exhaust pipe. A few of them with the connected data are reproduced in order to show what was actually accomplished. These cards are compared, side by side, for speeds that are approximately the same, and it will be seen that the reading given for the smokebox vacuum is usually slightly higher for the double-nozzle exhaust pipe than it is for the Smith pipe. But there is an element that enters into this matter that does not appear in the bare statement of the fact, and that is that the vacuum was much more steady with the new pipe; there were not those wide variations occurring between exhausts that are characteristic of the ordinary nozzle; in other words, the vacuum was more steady.

The cards show, moreover, that where the speeds and boiler pressures are approximately the same, the back pressure is perceptibly less than it was with the double nozzle. The two cards taken from the engines when running at a speed of 48.08 miles per hour show that a back pressure of 5 lbs. and 4 lbs. was exerted in the cylinders, while only 4 lbs. was found in those having the Smith exhaust, although the initial pressure was 15 lbs. higher in the latter case. This same relationship will be found to exist throughout all of the cards placed in comparison. These cards also show the care that has been taken in the designing of the valve motion and the close equalization of the cut-off that has resulted.

In short, these engines may be taken as fine examples of modern locomotive practice, and with their first-class steaming qualities, the roominess of the cab, the convenience of the fittings and the ease with which they can be handled, they should be popular not only with the officers of the road but with the men who are called upon to operate them.

#### Comparative Efficiency of Pintsch and City Gas.

We have received a copy of a report made by Mr. P. H. Brangs, Electrician of the Delaware, Lackawanna & Western Railroad Co., of an investigation of Pintsch gas, compressed city gas, Pintsch lamps and Gordon-Mitchell lamps, as used for car lighting.

Mr. Brangs first takes up the cost per thousand cubic feet of Jersey City gas compressed and supplied to cars, on a basis of a maximum of 40,000 cu. ft. per day and an average of 30,000. He starts with city gas at \$1.50 a thousand; allowing 20 per cent. for loss by compression and leakage raises the cost to \$1.80. The cost of compressing he finds to be \$0.945. This is made up as follows:

Labor, compressing.....	18
Labor, charging cars.....	18
Repairs and renewals to compressing, storage and supply plant .....	12
Interest on plant .....	14
Depreciation .....	14
Coal for compressing (106 lbs. per thousand).....	16
Water for compressing (1,500 lbs. per thousand).....	025

It will be remembered that Messrs. Denton and Chandler, in their investigation for the Lehigh Valley, arrived at \$1.003 as the cost of compressing and charging.

original method of comparing the illuminating values of the systems directly without referring to candle power. Test B was made by determining the illumination from each system in terms of a standardized burner and comparing the results. These tests were carried out as follows:

(A.) The car was fitted so that two argand lamps burning city gas were in one-half of the car, and two Pintsch argand lamps No. 1 burning D., L. & W. gas were in the other half, and afterward with two D., L. & W. standard lamps with three No. 80 tips in place of the Pintsch argands No. 1. A black curtain was hung from the ceiling at the middle of the car, completely dividing the car. A photometer disk was arranged in an aperture of this curtain, placed 50 in. above the floor level, this height being about the average of a passenger's eyes when seated or standing. If the illuminating powers of the lamps were equal, the disk would so indicate; but in each case the light from the Pintsch gas was decidedly the stronger. To find out the relative amounts of light from the two sets of lamps which were being compared, slides parallel with the disk with a determined light-obstructing value were interposed, thus cutting off the light from the disk until the illuminations on both sides were equal.

The results showed that the Pintsch argand No. 1, burning 3.5 cu. ft. of Pintsch gas per hour gave 2.04 times as much light as the city gas, burning 7.85 cu. ft. of gas per hour; or the Pintsch gas gave 4.59 times as much light per cubic foot as the compressed city gas did.

The results with the D., L. & W. standard lamp, with No. 80 tips, burning 3.89 cu. ft. of Pintsch gas per hour, gave 2.48 times as much light as the city gas, burning 7.9 cu. ft. per hour, or the Pintsch gas gave 5.04 times as much light per cubic foot as the compressed city gas.

(B.) The method B was the same as devised by Dr. W. H. Chandler, of Lehigh University, and used in his tests for the Lehigh Valley Railroad Co. A curtain was hung midway between the first and second lamp. The photometer disk was located in an aperture in the curtain, and 50 in. above the floor.

The illumination from the second, third and fourth lamps was measured, readings being taken with the photometer disk at the angles of 90, 75 and 60 degrees with the horizontal.

The results showed that the Pintsch argand No. 1 burning 3.48 cu. ft. of Pintsch gas per hour gave 1.65 times as much light as the argands burning 8.44 cu. ft. of city gas per hour; or the Pintsch gas gave 4 times as much light per cubic foot as the compressed city gas did.

The results with the D., L. & W. standard lamp with No. 80 tips, burning 3.71 cu. ft. of Pintsch gas per hour, gave 2.16 times as much light as the argands, burning city gas at the rate of 8.44 cu. ft. an hour; or the Pintsch gas gave 4.93 times as much light per cubic foot as the compressed city gas did.

The D., L. & W. standard lamps, with four No. 40 tips, burning 3.36 cu. ft. of Pintsch gas per hour, gave 1.39 times as much light as the argands, burning 8.44 cu. ft.

given above in sufficient detail for practical purposes. If anyone wants to study the particulars of the tests, presumably he can get a copy of the report on application to Mr. Brangs.

#### 200 Horse-Power Baldwin-Westinghouse Electric Mine Locomotive.

The Baldwin Locomotive Works have recently delivered to the Crozer Coal & Coke Co., at Elkhorn, W. Va., the largest electric mine locomotive ever built so far as we know. The illustrations show the general appearance and some details of construction. The common electric mine locomotive has about 50-H. P. capacity and seldom exceeds 80. In this case the work was so heavy that a special steam locomotive was designed to be substituted for an inadequate electric locomotive formerly used in the mine. The Baldwin company offer the same guarantees for both steam and electric locomotives and of the two kinds the Crozer Coal & Coke Co. finally took the electric.

The requirements were a six-wheel connected locomotive, weighing about 45,000 lbs., and guaranteed to haul 40 cars up a grade of 2 per cent. at the rate of 6 miles an hour, and developing a draw-bar pull of 10,000 lbs., using sand. Radius of sharpest curve, 60 ft.; weight of rails, 40 lbs. per yard; gage, 44 in. Locomotive to pass through an opening 6 ft. 11 in. high above rail, 10 ft. wide at bottom, and 8 ft. wide at top.

The general dimensions and specifications are as follows:

Diameter of driving wheel.....	33 in.
Total wheel base.....	6 ft.
Extreme width, not over.....	6 ft. 2 in.
Extreme length over all, about.....	18 ft.
Weight in working order.....	44,000 lbs.
Extreme height.....	5 ft. 6 in.
Two 100-H. P. consequent pole motors, with steel fields wound for 500 volts. Gears of cast steel, accurately cut. Gear cases of sheet iron, oil tight at bottom, and completely surrounding gears. Top field with hinged lid for reaching armatures and commutators. Rings in top fields for hoisting.	
Driving axles of best hammered iron with journals 5 1/4 in. in diameter by 6 1/4 in. long. Axles turned all over.	
Driving wheels of cast-iron, spoke type, keyed to axles. Tires of open-hearth steel, 5 in. wide and 2 1/4 in. thick.	
Parallel roads of hammered iron with brass bushings and oil cups.	
Crank pins of steel accurately turned and pressed into wheels with hydraulic pressure.	
Frames of wrought iron, with wrought-iron jaws. Jaws protected from wear of boxes by cast-iron shoes.	
Foot plates of cast iron bolted to frames.	
This locomotive has two sand boxes, front and back, two electric headlights with parabolic reflectors and brakes operated from both ends and of sufficient power to slip drivers when necessary, one electric controller operated from both ends and suitable for two 100-H. P. motors. All electrical apparatus, including rheostats, controller poles and switches, are provided to operate the locomotive. The workmanship is equal in all respects to that given to steam locomotives. All similar parts are interchangeable and all turned bolts to have a driving taper fit.	

The gage of the track being but three feet, it was impossible to get the 100-H. P. motor's dome between the wheel flanges. This fact, together with the slow speed at which the locomotive was required to develop its rated power, compelled the use of intermediate gearing. An economical motor will always have a rather high



speed, as this reduces the first cost and increases the efficiency of operation, and therefore for all electric rack locomotives, and others for slow speed, it will be found more economical and practicable to use double reduction gears than slow speed motors. The extensive analysis made of these practical matters by the Baldwin Locomotive Works has permitted them to outline a plan of construction for electric locomotives of all sizes which can be sold at the same price as steam locomotives that will do the same work. This line of machines will be described in the new electric catalogue to be issued by the Baldwin Works this month.

The mine locomotive shown by the illustration is in striking contrast in appearance to some of the smaller sizes that have been built before this. The details of this machine, by reason of its size, are all large and re-

followed by Mr. E. P. Ripley, President of the Atchison, Topeka & Santa Fe, who likewise gave the agents a hearty welcome, and gave a practical talk upon the responsibilities and accomplishments of railroad agents. His remarks elicited the closest attention and made a lasting impression.

The convention was then addressed by Mr. M. J. Carpenter, President of the Chicago & Eastern Illinois, who, having risen from the ranks of the local agents, showed a thorough familiarity with and appreciation of the trials and labors of the average agent, and he won at once the entire sympathy of the large audience.

Twenty-eight local associations were represented (out of 40) and the attendance was 168 delegates, more associations and a larger representation than at any previous meeting. The reports of the officers and standing com-

that the original bill of lading should be surrendered before returning goods ordered returned by consignors. Abbreviations in billing were generally discussed and many instances were shown where loss had occurred, directly because of the misuse of abbreviations in billing, and it was resolved that agents should discourage all abbreviations in billing.

The Committee on Uniform Way Bill reported that the Railway Accountants' Association declined to consider any change in its present form, Association Standard No. 101. Mr. C. G. Phillips, secretary of that organization, was present, and stated that it was not a question of merit or demerit of the proposed way bill; the accounting officers had recently made a form (101), which had been adopted by a large number of lines; they hoped to secure its universal use, and feared to discourage it by a change at this time; but when the general use of form 101 had been accomplished he did not doubt his association would be pleased to consider any recommendations made by this association, as its ability to do so was plainly recognized. Upon motion of the chairman of the committee, Form No. 101 was endorsed as the standard form until such time as it might be expedient to improve it.

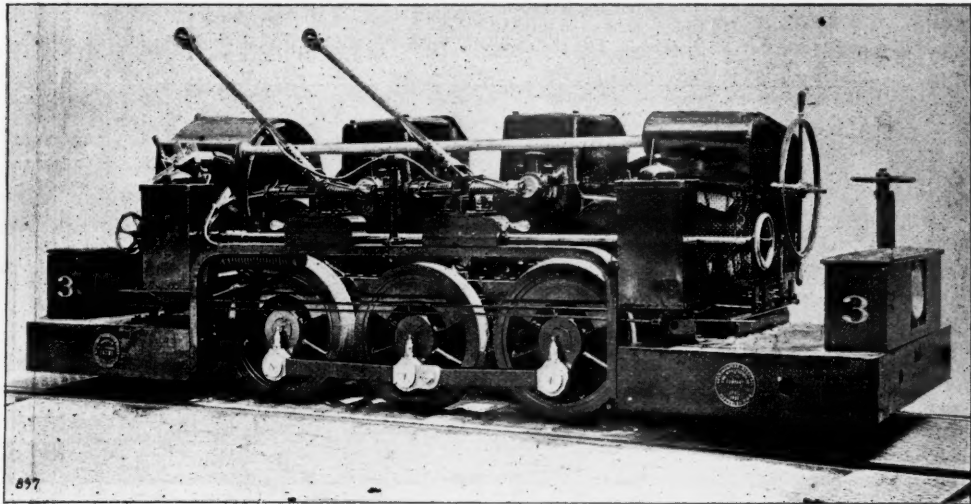
"Proper deliveries" was the subject of a paper by Mr. M. Townsend, of New York, who recited the difficulties of a proper identification of freight and also of consignees in large cities; he recommended the method of car numbering and dating packages known as the "Tucker System." Mr. Townsend's recommendations were adopted as the recommendations of this association.

The question whether collection of car service (demurrage) should be made by the Car Service Association or by the agent brought out a large number of papers and statistics, occupying almost the entire morning of the third day of the meeting. Those in favor of the former were in the minority from the start, and made gallant arguments in favor of Car Service Associations making the collections, but upon a vote it was decided the agent was the proper person to make the collections.

Checking and loading freight, noting discrepancies, etc., was presented by Toledo members, followed by several others. The general opinion was that men must be intelligent, cars must have special loading numbers and truckmen must be thoroughly disciplined.

The suggestion that local associations exchange minutes was debated briefly and it was decided that parts of the minutes of local associations relating to matters of general interest should be exchanged.

Members from Wheeling, W. Va., brought up the subject of "Car Accounts" and offered some good suggestions as to keeping a complete check upon the movements of cars at his station by the local agent; the papers were ordered spread on the minutes. A proposition to adopt an "official organ" for this association



200-Horse Power Electric Mine Locomotive.

By the BALDWIN-WESTINGHOUSE COMPANIES.

For the CROZER COAL & COKE CO.

quire no special protection, hence they are exposed like the parts of a steam locomotive. Only those parts are covered which are liable to injury from rain. On one end is a controller of the commutator type which is operated by a shaft and gear from the opposite end when desired. On the other end are the rheostats for controlling the current at starting. The train wiring is enclosed in a large wrought-iron pipe, and the connections are all thoroughly protected. This locomotive has been in operation for some weeks, and hauls the specified load easily and satisfactorily. Other mine locomotives are in the process of construction, and this feature of locomotive building promises to become important within a few years.

#### Annual Meeting of National Local Freight Agents' Association.

The ninth annual convention of the National Association of Local Freight Agents' Associations was held at the Tremont House, Chicago, June 9, and was called to order by the President, Mr. Lot Brown (C., B. & Q.). Mayor Swift welcomed the delegates to the city, and was

mittees showed a prosperous condition of affairs, and a decided increase in the interest manifested by the members.

The special committee appointed at New York had not yet been able to get a decision guaranteeing protection to railroads against loss of transportation charges on freight delivered to United States bonded warehouses, and it was continued for another year.

A special committee recommended a uniform trace blank, which was adopted and referred to the Conference Committee, with instructions to endeavor to secure the co-operation of other railroad organizations.

A paper on "Seniority in Making Promotions" was presented by Mr. Perkins, of Buffalo, and a vote of the association showed a decided inclination to give seniority a preference when fitness and merit were equal.

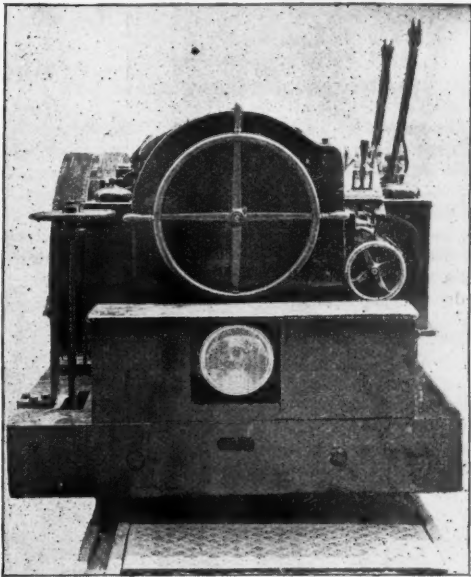
The second day's session opened with a discussion of the code of terms used in freight accounts adopted by the Association of Railway Accountants, and the meeting voted to concur.

"Should the Yard Clerk be under the control of Agent or Yard Master?" was discussed and was decided in favor of the Agent. The meeting approved the proposition

TABLE OF AVERAGES OF RESULTS OF LABORATORY TESTS OF BRAKE SHOES.

Reprinted from the Proceedings of the Master Car Builders' Association for 1895, except that lines four and five give later determinations. The results of these important tests are discussed on the editorial pages.

Material of shoe.	Maker of shoe.	Kind of wheel.	Initial speed, miles per hour.	Mean pull on brake, pounds.	Average coefficient of friction.	Average efficiency at beginning of application, per cent.	Average efficiency of max. coefficient of friction at end of application, per cent.	Pressure on brake shoe, pounds.
Malleable iron.....	Dayton Mal. Iron Co.....	Chilled cast iron	39.90	547.6	19.6	24.0	35.5	2,798
Soft cast iron.....	Penna. R. R.....	"	40.02	869.9	31.3	34.8	42.1	"
Hard cast iron.....	Ramapo Wh. & F'dry Co.....	"	40.41	568.1	20.3	26.1	36.6	"
Soft open-hearth steel.....	Solid Steel Co.....	"	40.58	683.5	24.43	22.96	33.96	"
Hard open-hearth steel.....	Solid Steel Co.....	"	40.61	678.7	24.26	22.63	37.42	"
Special "S. T." mal. iron.....	Dayton Mal. Iron Co.....	"	40.55	537.3	13.2	25.1	31.2	"
Wrought iron (pressed).....	Schoen Mfg. Co.....	"	40.46	563.3	20.1	22.1	36.5	"
Special "C. W." mal. iron.....	Dayton Mal. Iron Co.....	"	40.83	549.5	19.7	23.9	36.4	"
Soft steel (pressed).....	Schoen Mfg. Co.....	"	40.01	553.5	19.8	22.4	32.6	"
The Congdon shoe.....	Sargent Co.....	"	40.37	568.9	20.3	27.5	31.3	"
The Meehan shoe.....	Sargent Co.....	"	40.37	449.1	16.0	22.8	25.8	"
The Lappin shoe.....	Sargent Co.....	"	40.46	544.7	19.5	21.2	28.4	"
The Safety shoe.....	Lappin Brake Shoe Co.....	"	40.42	472.8	16.9	18.4	32.3	"
Soft cast iron.....	Safety Brake Shoe Co.....	"	40.05	824.3	29.4	33.0	37.3	"
Hard cast iron.....	Penna. R. R.....	"	63.90	1,603.6	14.9	16.1	21.3	10,733
Soft open-hearth steel.....	Ramapo Wh. & F'dry Co.....	"	64.71	1,179.4	10.9	12.3	16.6	"
Hard open-hearth steel.....	Solid Steel Co.....	"	64.69	1,058.3	9.8	10.3	18.6	"
Malleable iron.....	Solid Steel Co.....	"	64.80	974.7	9.1	9.8	16.2	"
Special "S. T." mal. iron.....	Dayton Mal. Iron Co.....	"	64.37	979.9	9.1	9.3	15.2	"
Special "C. W." mal. iron.....	Dayton Mal. Iron Co.....	"	64.99	879.4	8.2	9.0	14.9	"
The Congdon shoe.....	Dayton Mal. Iron Co.....	"	64.22	857.1	8.0	8.5	15.5	"
The Meehan shoe.....	Sargent Co.....	"	63.71	1,115.8	10.3	10.1	18.1	"
The Lappin shoe.....	Sargent Co.....	"	64.62	962.2	8.9	9.9	16.2	"
The Safety shoe.....	Lappin Brake Shoe Co.....	"	64.32	915.3	8.5	8.5	14.3	"
Soft steel (pressed).....	Safety Brake Shoe Co.....	"	64.43	1,301.0	16.8	16.3	24.9	"
Wrought iron (pressed).....	Schoen Mfg. Co.....	"	64.38	1,023.5	9.5	8.9	18.6	"
The Sargent shoe.....	Schoen Mfg. Co.....	"	64.71	1,258.0	11.7	11.6	20.8	"
Soft cast iron.....	Sargent Co.....	"	64.48	1,214.5	11.2	13.1	17.4	"
Hard cast iron.....	Penna. R. R.....	Steel tire.....	64.82	1,057.7	9.9	12.4	18.7	"
Soft open-hearth steel.....	Ramapo Wh. & F'dry Co.....	"	64.94	906.3	8.5	9.5	16.2	"
Hard open-hearth steel.....	Dayton Mal. Iron Co.....	"	64.69	885.5	8.1	8.7	15.3	"
Malleable iron.....	Dayton Mal. Iron Co.....	"	64.80	829.1	7.7	8.7	14.8	"
Special "S. T." mal. iron.....	Lappin Brake Shoe Co.....	"	64.34	870.1	8.1	8.6	15.8	"
Special "C. W." mal. iron.....	Dayton Mal. Iron Co.....	"	65.01	917.1	8.5	9.4	15.5	"
The Congdon shoe.....	Safety Brake Shoe Co.....	"	64.71	1,258.0	11.8	13.8	18.0	"
The Meehan shoe.....	Safety Brake Shoe Co.....	"	64.71	1,158.0	10.8	11.5	17.4	"
The Lappin shoe.....	Sargent Co.....	"	64.94	895.9	8.4	9.1	16.4	"
The Safety shoe.....	Sargent Co.....	"	64.62	949.9	8.8	9.6	15.5	"
Soft open-hearth steel.....	Solid Steel Co.....	"	64.97	1,181.5	11.0	10.4	22.0	"
Hard open-hearth steel.....	Solid Steel Co.....	"	65.26	1,183.6	11.0	10.2	21.6	"
Soft steel (pressed).....	Schoen Mfg. Co.....	"	.....	.....	.....	.....	.....	"



200-Horse Power Electric Mine Locomotive.

was recommended by a committee and had the approval of the officers, but on a vote was lost.

The session of the convention closed on Friday morning by the election of officers as follows: F. P. Eyman, of Milwaukee, President; Jas. V. Braden, of Wheeling, W. Va., Vice-President; W. J. Jackson, of Chicago, Secretary; C. H. Newton, of Fort Wayne, Treasurer.

Washington, D. C., was selected as the next place of meeting.

#### The New Atlantic City Engines of the Philadelphia & Reading.

On the 29th of May the Philadelphia & Reading put into service a couple of Baldwin compound locomotives for the fast and heavy passenger business between Philadelphia and Atlantic City. Particulars of certain runs of these engines and a profile of the road appear herewith. The engines are of the "Atlantic" type and in all general dimensions are precisely like the Central of New Jersey engine which we illustrated a week ago. For the dimensions, therefore, we refer the reader to the



table printed in that issue, merely stating here that the cylinders are 13 and 22 x 26 in.; the drivers are 84 in. diameter; the total weight is about 143,000 lbs. and the weight on drivers is about 78,600 lbs. The total heating surface is 1,835.1 sq. ft.

The engine of which the record has been sent to us is No. 1026 and the time through on 12 different days is given in the following table. The train started in each case from Camden, mile post 56, and ran to Atlantic City, one-half mile beyond mile post 1. The train generally included two Pullman cars, but on May 29 and June 6 there were three and on two other trips there was only one.

ATLANTIC CITY RAILROAD, 4 P. M. TRAIN, CAMDEN TO ATLANTIC CITY, 55.5 MILES.

1896.	Cars.	Left Camden.	Arrived Atlantic City.	Total time minutes.	Average water, gals. per minute.	Average fuel, gals. per mile.
May 29.	7	4:10:45	5:03:15	53	57.3	57.7
" 30.	7	4:11:30	5:03:30	52	57.1	57.7
June 1.	6	4:10:40	5:01:40	51	54.1	49.7
" 2.	6	4:11:30	5:02:00	51	53.5	49.0
" 3.	6	4:11:00	5:03:30	52½	51.0	48.3
" 4.	6	4:10:00	5:02:00	52	48.5	45.5
" 5.	7	4:10:00	5:02:00	52	55.4	51.9
" 6.	9	4:10:10	5:06:10	56	52.1	52.6
" 8.	6	4:10:00	4:59:00	49	56.3	49.6
" 9	6	4:10:00	5:00:00	50	60.0	54.0
" 10.	6	4:09:00	4:57:00	48	56.0	48.3
" 11.	7	4:09:32	5:00:00	50½	55.1	50.4

The time of the run on June 6, when there were nine cars, including three Pullmans, and that of the run of June 10, when there were six cars, including one Pullman, is given in the following table, in seconds for each mile of the run, the former being the heaviest train in the record and the latter being the run in which the best time was made. The rate of speed through on June 6 was 59.5 miles an hour and on June 10 it was 69.4 miles an hour.

Mile post.	Time, June 6.	Time, June 10.	Mile post.	Time, June 6.	Time, June 10.
55	153	155	24	33	46
54	91	79	27	55	45
53	76	61	26	50	45
52	70	60	25	52	47
51	72	60	24	52	47
50	70	58	23	50	45
49	63	55	22	54	48
48	63	53	21	55	47
47	59	51	20	53	47
46	58	50	19	53	46
45	58	50	18	51	46
44	53	47	17	50	46
43	56	48	16	52	47
42	59	51	15	54	47
41	63	54	14	54	46
40	64	55	13	57	50
39	63	52	12	56	48
38	60	51	11	55	47
37	56	48	10	52	46
36	53	47	9	53	46
35	54	47	8	54	45
34	55	48	7	55	47
33	55	49	6	55	47
32	52	46	5	48	44
31	52	46	4	55	44
30	53	48	3	54	46
29	51	48	2	56	46
			1	76	62

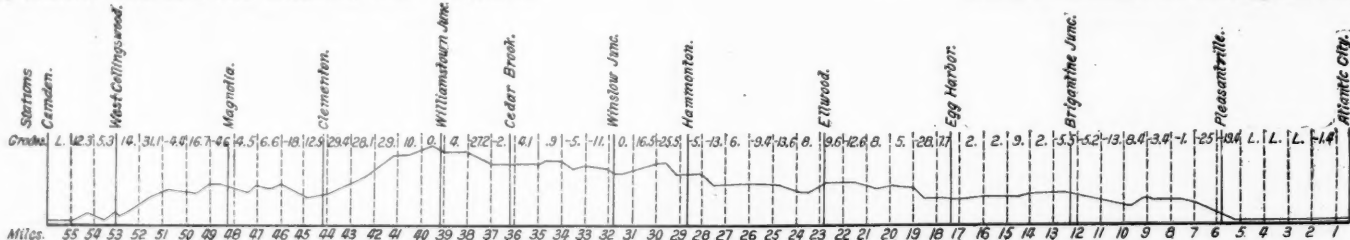
The Master Car Builders' Convention.

The convention of the Master Car Builders' Association opened at Saratoga this week with a large attendance and with promise of an unusually interesting collection of exhibits. We go to press too early to attempt to give any report of the discussions, and it is impossible to give this week a complete list of the articles exhibited. Abstracts of a number of the reports follow, and a partial list of the exhibits.

METAL UNDERFRAMING FOR FREIGHT CARS.

(The Committee consists of Messrs. R. P. C. Sanderson, J. D. McIlwain, J. R. Skinner and John Player.)

A recent form of iron bolster is shown in Fig. 7. A simple, very strong and cheap steel bolster, which has stood the test of service well, is shown at Figs. 8 and 9. Here should also be mentioned the Schoen pressed steel, American and Shickle, Harrison & Howard cast-steel body bolsters, which have been extensively illus-



trated in the technical journals and are well known to the members.

It is very probable that the use of iron and steel in car construction would have advanced far beyond its present standpoint but for prejudice which has grown up in the minds of many against all iron or steel cars, as the result of some unfortunate ventures in which the designers either did not fully understand the service and strains a freight car has to withstand, or from lack of experience, and in an endeavor to keep the weight and cost of their cars down to limits which would enable them to make sales, placed cars in service that have become a by-word on account of their frequent and prolonged sojourns on the repair tracks.

It would be eminently desirable if the M. B. stand-

ards could be issued in advance for the guidance of railroad companies instead of being adopted after the need for such standards has led to the use of a multiplicity of designs, which add to the expense and delay in car repairs. Car building is anything but an exact science, and the evolution of a standard design for an iron or steel car frame must come after many experiments, errors and failures, profiting by which experience we will ultimately achieve success.

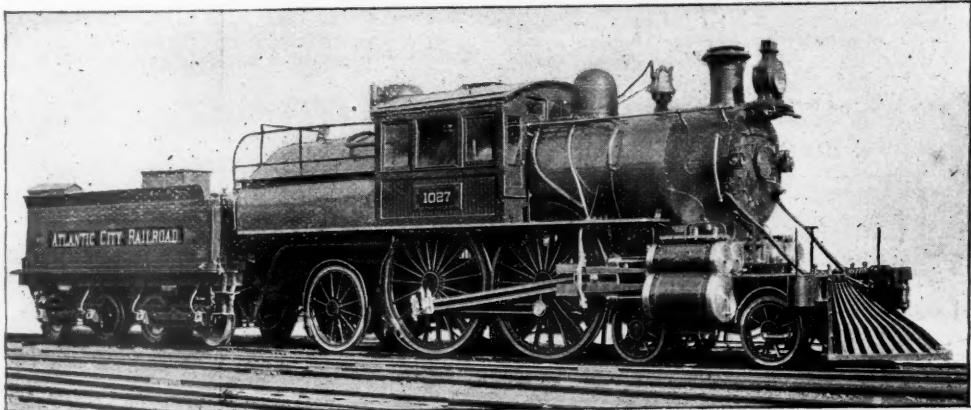
Even if the members of your committee felt that they could present a design for standard steel framing for freight cars which would be practically perfect and require no future modification (which is not the case), it would not be practicable to do so until greater uniformity in the lengths and sizes of interchange freight cars for given capacities has been brought about. It is hoped that a thorough inquiry into the subject will be made by the association by means of a committee to recommend standard lengths of sills and widths over sills for refrigerator, box, stock, flat, drop bottom and drop-end

bridge specifications and regular market sizes should be generally preferred, so that railroads and car builders can avail themselves of the competition in the open market when purchasing, or if not equipped to put steel frames together themselves, can have this work done for them at any of the numerous bridge-building concerns on competitive bids, the underframes, riveted or bolted together, can be shipped by carloads to the car shops to be completed into finished cars.

Third. Get-at-ability in the design is of the greatest importance in keeping down the first cost and maintenance; parts that are to be riveted together should be so arranged that they will be equally convenient for hydraulic or power riveting when the car is being built, or for field riveting in repair work.

Fourth. In designing riveted work, it should be laid off with plenty of rivets, these to be spaced close, as in boiler work, and the same care to insure true fair holes, hot rivets, well driven and completely filling the holes as in first-class boiler work, is necessary. Complaints sometimes heard against riveted work in car frames and tender frames, on account of loose rivets, can be directly traced to an insufficient number of rivets and poor riveting.

Fifth. If bolts are used to hold iron or steel parts in



Express Engine for the Atlantic City Railroad.

Built by the BALDWIN LOCOMOTIVE WORKS, Philadelphia.

gondola cars of 60,000, 70,000 and 80,000 lbs. capacity, and that the association will adopt such standards.

After this step has been taken, then, with sufficient experience and knowledge to guide them, a committee could take up the subject of steel underframing for freight cars, and, with good hope of success, present to the association a series of designs for M. C. B. steel underframes that could be adopted and used, as far as their general features are concerned, without fear of serious failure ensuing.

As long as the main framing of foreign freight cars coming on our repair tracks is of timber (which can be cut and dressed to suit by the ordinary carpenters' tools), and of iron truss rods and bolts (which can be cut or welded by any blacksmith), odd sizes of sills, etc., are not such a serious matter, but when we come to steel and iron, which require heavy machine tools and shop treatment, and where odd sizes or shapes must be specially ordered and rolled or forged at the forges or mills, the question of uniformity of sizes becomes one of paramount importance.

With standard lengths, depth, width of flange and weight per foot for sills of all flat-bottomed cars of 60,000, 70,000 and 80,000 lbs. capacity, the rolling mills can carry the stock ready for instant shipment, feeling safe that they will not have it left on their hands as obsolete stock; the sills and shapes in stock at any railroad shop store would be certain to suit any foreign car that might come on the repair tracks, only requiring that the holes, etc., should be laid off and punched or drilled to suit the details of the particular car, but before this happy state of things can be brought about, the standards for lengths and widths of cars must be adopted, and—when steel-framed cars are built—rigidly adhered to.

position, not merely to carry weight, they must be turned bolts (a driving fit), in carefully reamed holes, fitted with the greatest care. When so fitted they will probably give no trouble from working loose, but as this is machine-shop work, such bolts should be avoided as far as possible, as it is not likely that such bolts will be fitted in this way on the repair tracks, while it is reasonable to expect that a hot rivet, well driven, can be put in anywhere with the aid of a portable forge. In both riveted and bolted work it is of the utmost importance to perfectly fill the holes, remembering that it is the "initial wiggle," if only 1-1000 part of an inch, that will surely produce loose rivets and bolts and oblong holes; no amount of hammering on the heads of rivets or tightening up nuts or bolts, or the use of lock-nuts, nut-loops or fibrous washers will be of any use, if the holes are not perfectly filled.

Sixth. It is believed that the center sills of a freight car should be made its main strength and reliance, and that the entire load shall be carried from the platform, the upper works being simply arranged as a housing to confine and protect the load.

Seventh. To enable the center sills to withstand collision and severe shocks to the best advantage, these sills should be spaced so that they will be directly in line with the dead blocks, and thus take the buffing and collision shocks in direct compression. Also their depth should be such that at least the center line of draft and centers of the dead blocks will be within the vertical dimensions of the sills. When so arranged there will be no tendency from shocks or pulling strains to bend the center sills, either laterally or vertically, or to bend or break the end sills.

Eighth. That care should be taken to avoid punching or drilling holes in the flanges of channels or I-beams where these are subject to heavy strains, especially tension or bending strain, unless additional material is added to compensate for this.

Ninth. That with the change from wood to steel the necessity for truss rods no longer exists for cars of reasonable lengths, but that ample and sufficient strength can be obtained within reasonable limits of weight without the use of truss rods and consequent need of adjustment.

Tenth. On account of the sweating and rusting of iron

Pending the adoption by the association of the standard lengths and widths for given capacities, your committee presents the following rules or recommendations, which they feel justified in asserting should be seriously considered by designers of steel framing for freight cars.

First. Especially forged, pressed or rolled shapes, cast steel, etc., or patented forms of construction are undesirable for cars to be used in general interchange business, no matter how well designed theoretically, for the reason that when such parts are damaged there must necessarily be long delays in ordering and obtaining these special parts, and should the parties who have furnished them go out of business, or change their molds or patterns, the parts cannot be duplicated for repairs except at an enormous expense and loss of time.

Second. Steel and iron bars and shapes of standard

and steel, wood is preferable to iron or steel for flooring, siding and lining of merchandise and stock cars. Much has been said and written on the subject of corrosion of iron and steel brake beams, bolts, pipes, rails, etc., from the action of sulphuric acid leachings from coal cars and salt-water drippings from refrigerator cars and manure drippings from stock cars.

There is no doubt that there is serious corrosion from these and other causes under certain conditions, but evidence exists that steel framing under tenders and iron work under coal cars in constant service, and steel framing of cars exposed to very damp and destructive climatic influences for many years, have not suffered materially from these causes. Doubtless preservative paints can be found that if properly used when the steel frames are first built and with occasional repainting will sufficiently protect the steel from corrosion, but as this is a very important subject your committee would recommend that it be made a special subject for committee in-



vestigation by a series of tests ranging over nine or ten months' time.

There is an economical side to this question which your committee desires to call attention to before closing their report, namely, how much additional weight and how much additional first cost can be put on a car without ultimate loss.

First. As regards the question of increased light weight of freight cars of given capacities having steel underframes, your committee feels that they need only state that it is proven to be quite practicable to build cars with steel frames of greater strength and capacity with less light weight than when wooden or composite underframing is used, and that with more experience in the right methods of construction and a proper appreciation of the capabilities and best uses of steel the proportion of carrying capacity to light weight can be still further increased for large capacity cars without danger of increasing the subsequent running repair account.

Second. With regard to the question of probable increased first cost of freight cars having steel underframing, the question is, "Will it pay?" There are so many factors governed by local conditions which must enter into the calculation that each company must figure this out for its own set of conditions.

One factor, namely, the repair account, should, however, here receive passing notice. From the best information obtainable your committee believes that it is very nearly correct in stating that the charge for wheels, axles, springs, paint, chain, brake shoes, brasses, couplers and other parts that will wear out and fail as much under the most perfect steel-framed car as under the poorest design of wooden-framed car in same service will constitute about 50% per cent. of the average total

right to assume, including private cars, that 30 per cent. of all freight cars are constantly away from home.

Taking one lot of 1,000 cars, we can assume that as above the freight earnings could be increased

The mileage earned from foreign roads increased.....	\$8 280.00 per annum
	300.00 " "
	\$8,580.00 " "
Estimated possible saving in repairs, say 20 per cent. of \$72 per car per annum .....	14 400.00 " "
	\$22,980.00 " "

As the steel framing when put up in lots by bridge builders ought not to increase the cost of cars more than \$75 per car at most, this figure of \$22,980 per thousand cars for savings and increased earning would approximate 36 per cent. per annum on the extra capital invested, amply sufficient to cover the depreciation and interest charges under the conditions above assumed.

In conclusion, your committee begs to present the following list of drawings of designs for metal underframing for freight cars for the consideration of the members, and begs that members will criticise these designs, using the ten rules or recommendations previously given as the basis for such criticism.

Norfolk & Southern, steel flat car of 30 tons capacity;

Norfolk & Western, steel frame coal hopper car, 30 tons capacity;

#### FREIGHT-CAR DOORS AND ATTACHMENTS.

(The committee consists of Messrs. F. H. Soule, J. J. Casey, W. J. Robertson, B. E. Thomson, Thomas Fildes, Charles Waughop, A. J. Cronwell and Mord Roberts.)

As covering, in a general way, the special features desirable in connection with an ideal freight-car door for box, stock and other classes of freight-car equipment, your committee would respectfully recommend that:

The door should be so constructed as not to be liable to bind or give trouble in working on account of swelling or warping slightly.

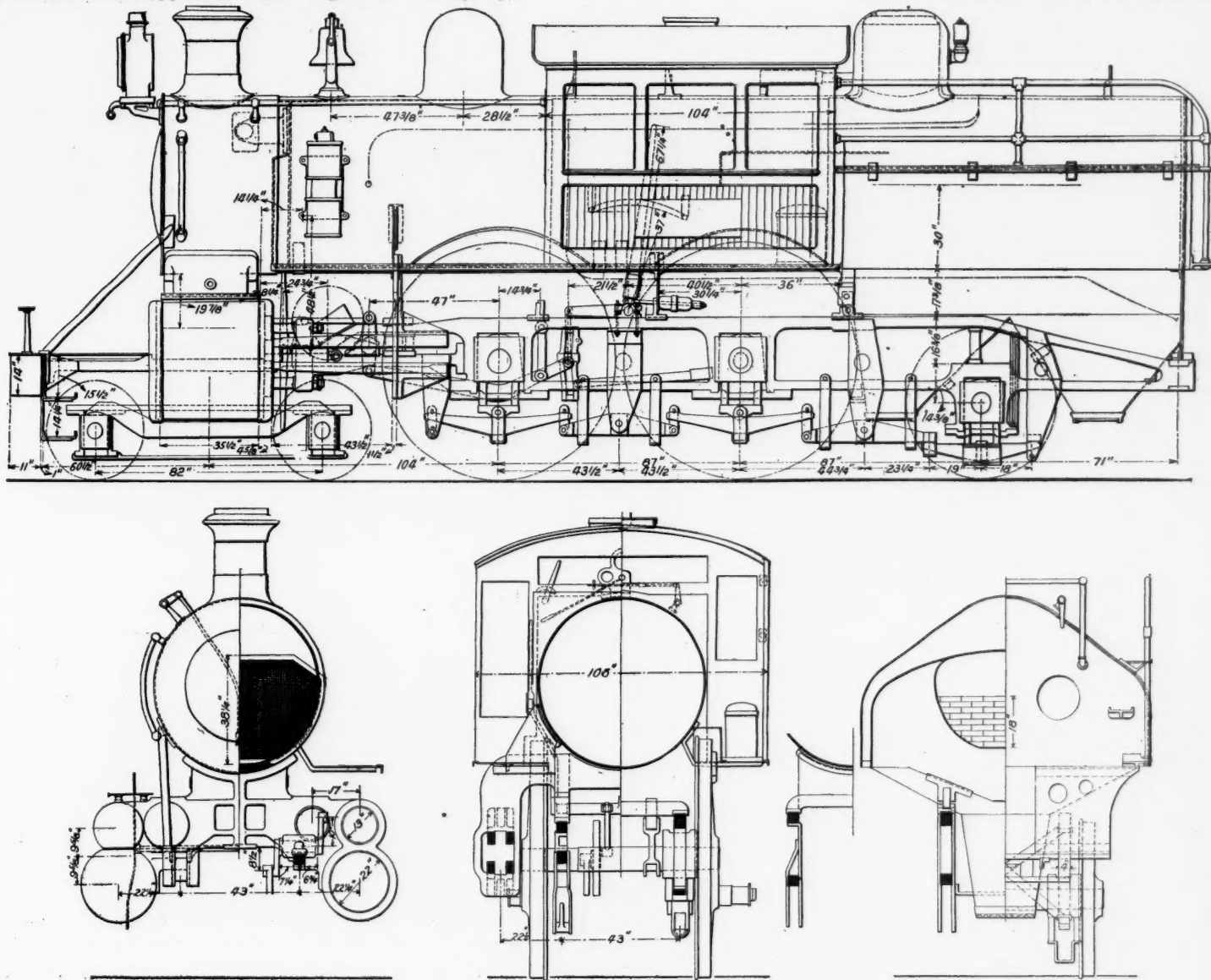
The door should be hung at the top with no rail at the bottom, which can be bent, and, from being bent, interfere with the free running of the door; and should be hung so as to move readily by small force applied at the bottom, middle or top; but should not move easily enough to roll back and forth by jerks in a freight train.

The door should be so arranged as to be weather and cinder proof at the top, bottom and both sides when closed, and should be so constructed that when it is locked and sealed, it would be impossible, without breaking and mutilating the door, to pry open the back end or bottom of the door, to permit entrance of the hand or hook.

The door should be so constructed that it cannot be pressed away from the car so as to swing out and strike passing trains or other objects, and should be absolutely proof against unhooking, excepting where the stop, against which it rests when open, is removed.

The door should be so constructed as to prevent it swinging out when in its closed position, even though all of the bottom brackets are removed, or in case one of the hangers should be broken or lost off.

The door should have such a style of locking arrange-



Baldwin Compound Locomotive for the Atlantic City Railroad.

cost of freight-car repairs, exclusive of inspection, oiling and packing. Then the two questions remain:

First. Of the remaining 49% per cent. how much can probably be saved by the use of a perfect steel underframing which would require no repairs except painting during the life of the car?

Second. Will this saving, added to the increased freight earnings of the car and to the increased mileage earnings when away from home (due to a less number of days per annum spent on the repair track), pay the interest and depreciation on the extra first cost of the steel car?

Taking the figures given in "Poor's Manual," the freight earnings per revenue car for 1894 were about \$1.38 per day, and the average mileage earnings of cars away from home are only about 15 cents per day.

Where the freight-car repair work is being kept up currently, the number of cars on the repair tracks can be kept down to four per cent. of the total equipment; this means that each freight car would spend about 14% days on the repair tracks each year. If we assume that only 40 per cent. of this could be avoided by the use of perfect steel framing, we can possibly save about six days on the repair tracks per annum. This would mean, if the freights were available, increased freight earnings of \$8.28 per annum per car, or 90 cents additional mileage earned per annum per car away from home. It is about

Proposed N. & W. steel frame, 30,000 lbs. capacity;

Design for 36-ft., 60,000-lb. box, stock or flat car framing, submitted by R. P. C. Sanderson and C. C. Wentworth;

Trapp's 80,000-lb. steel hopper car;

The Pennock steel car framing;

Steel car framing, submitted by Mr. John Player, a member of the committee;

Carnegie Steel Co., steel hopper, 100,000 lbs. capacity; light weight, 39,000 lbs.

At the time of closing this report, it is learned that the Illinois Steel Company is at work on designs for steel cars, drawings for which it is to be hoped will be received in time to present to the convention. It is also expected that a Norfolk Southern steel flat, Norfolk & Western steel-flat and steel-framed hopper, Pennock steel car, Carnegie and Illinois Steel Company's cars, will be completed and on exhibition at Saratoga for inspection by the members.

[These drawings not being in condition for direct reproduction with good results are omitted by us for the present. They will be given later. The Carnegie car we showed last week.—EDITOR.]

ment that it cannot be removed or tampered with from the outside, without at once making the fact known to the seal record taker as soon as he sees the fastening.

The above conditions should be considered as applying to end doors as well as side doors, with special reference to locking arrangements, which should have the same, or equal, provisions for sealing. In this connection, and for such action as the association may be pleased to take, the following communication from Mr. John T. Denniston, President Freight Claim Association, addressed to Mr. Lentz, is respectfully referred:

"At the meeting of the Freight Claim Association the question was raised about the seal record on the end doors of cars, on many of which no provision is made on the outside for sealing; they presumably being fastened on the inside of car. . . . It was requested that the association refer this matter to your association for consideration, and the suggestion whether your association could adopt a resolution requesting that all roads owning cars with end doors would make provision thereon that they could be sealed on the outside, so that a proper record could be obtained to enable the freight-claim agents in handling claims to properly locate the liability therefor."

In conclusion, the committee would refer to the danger to life and property incurred in the handling of private line cars equipped with hinged doors swinging outward. In the opinion of the committee such doors are much



more dangerous to passing trains than any other type of freight-car door extant. Such doors are inherently dangerous, from the fact that if unlatched they will gravitate to open position on the slightest oscillation of the car. Again, in many cases, they swell to such an extent as to prevent them from closing properly. The fastenings are also continually getting out of order. The committee is in hopes that the association may take some action that will prompt the private line people to the adoption of some safer form of door.

MOUNTING WHEELS.

(The committee consists of Messrs. J. N. Barr, R. E. Marshall, Pulaski Leeds, A. M. Waitt, J. C. Barber, J. H. McConnell and Thos. Sutherland.)

The committee appointed to review the subject of "Mounting Wheels and Standard Check Gage," together with "Standard Distance Between Wheels," believes that the standard dimensions for wheel gages, as given in the proceedings of 1895, are proper. In consideration of the check gage for mounting wheels as shown in Plate 12, and the standard wheel gage, as shown in Plate 7 (M. C. B. Proceedings, 1895), it believes that these two gages should be combined, as shown in Fig. 1, and that the term "Standard Reference Gage for Mounting and Inspecting Wheels" should be applied to the combination.

It does not think that the gage in this form is suitable for practical work either for mounting or inspecting wheels, but is more properly a reference gage; and it is for this reason it has suggested the name above. Attention is called to the fact that a slight change is made in the gage by enlarging the surface which comes in contact with the outside of flanges.

For the purpose of practical use in inspecting mounted wheels, both in shops and on the road, your committee presents a design, shown in Fig. 2, to be entitled "Standard Check Gage." The only dimension in this gage which differs from that shown in Fig. 1 is the distance between gage points, which is 4 ft. 8 1/4 in. instead of 4 ft. 8 1/2 in.; but as this dimension is not used in inspecting,

extends beyond the outside of tread, the wheel should be rejected.

The same if *F* and *D* are pressed against flange and tread, and *G* extends beyond outside of tread.

Your committee presents in Fig. 3 a light and simple form of gage for mounting wheels symmetrically on the axle. This gage has been in practical use for over a year and gives very satisfactory results. For those desiring

Third. That a gage for determining the center of the axle between centers of journals be used.

Fourth. That a gage for locating wheels equi-distant from the center of axles, as shown in Fig. 3, be adopted as recommended practice.

Fifth. That all axles be carefully centered between centers of journals prior to mounting.

Sixth. That wheels with flanges worn to a thickness of 1 1/8 in. or less should not be remounted.

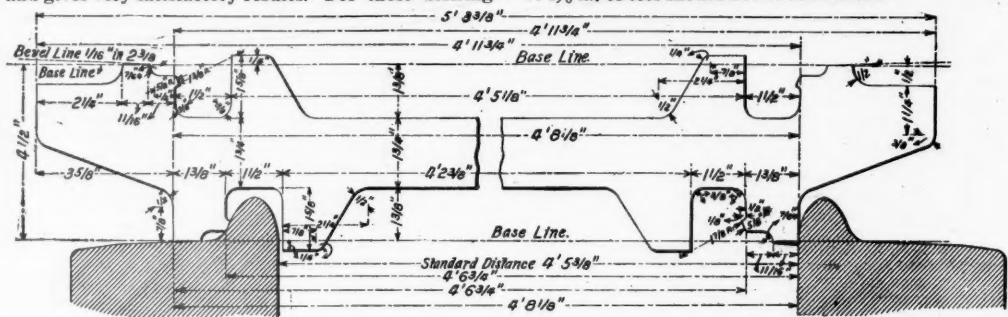


Fig. 1.—Standard Reference Gage for Mounting and Inspecting Wheels.

(With Report on Mounting Wheels.)

to mount new wheels from the outside of the flange, a suitable modification can readily be made. In the case of second-hand wheels, however, it is the opinion of your committee that the best practical results will be obtained by mounting from the inside of flange, and it is also the opinion of some of the members of your committee that the above remarks are equally true in the case of new wheels.

The committee believes that the best results will be obtained by the constant use of the proposed Standard Check Gage, at at least three points on the periphery of the wheels after mounting, as a positive guarantee of conformity to standards.

Seventh. That, as far as possible, the thickness of flanges of wheels fitted on the same axle should be equal, and should never vary more than 1/8 in.

Eighth. That, in mounting second-hand wheels, they be mounted to the standard distance between inside of flanges.

STENCILING OF CARS.

(The committee consists of Messrs. A. M. Waitt, S. Higgins and H. S. Hayward.)

Your committee, to whom was referred the communication from the Car Inspectors' Association of North America, recommending for the facilitating of work of inspection that all car owners be requested to stencil height and width of all high cars on the side of the car,

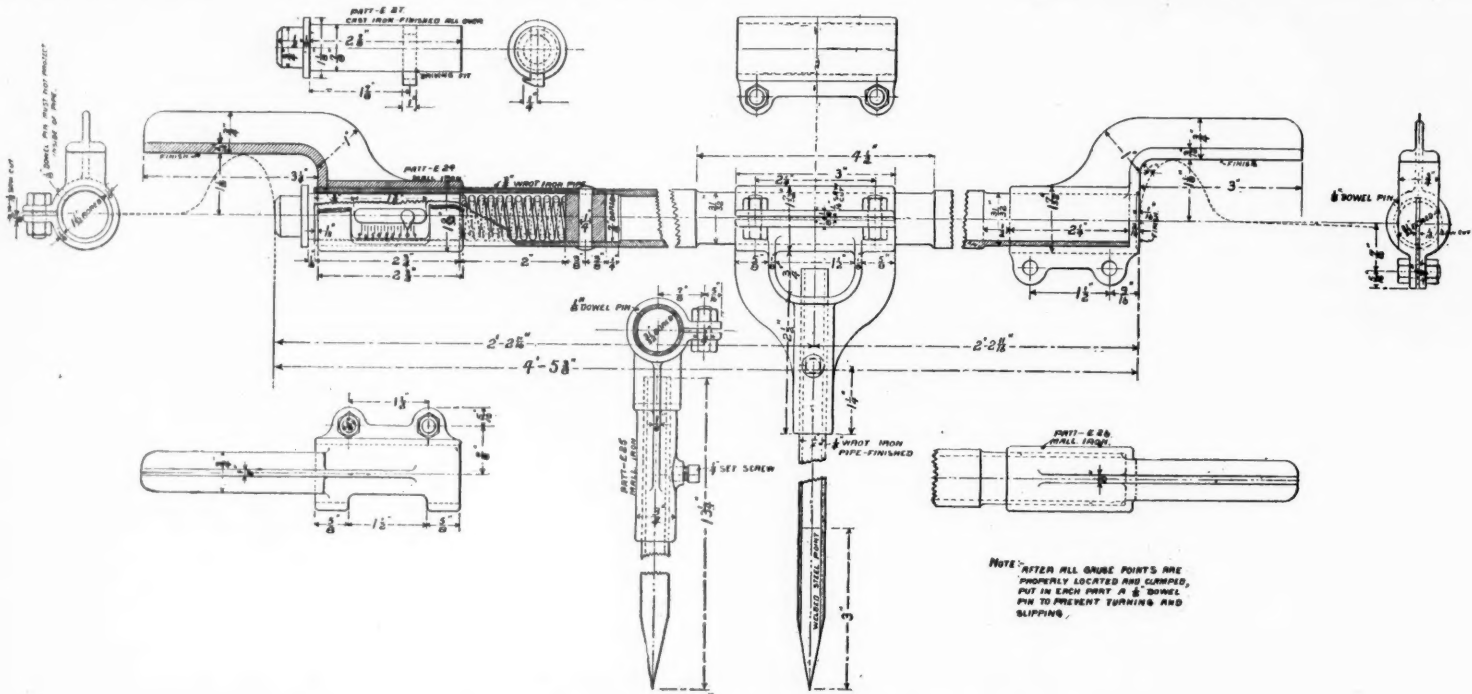


Fig. 3.—Gage for Mounting Wheels Symmetrically on the Axle.

(With Report on Mounting Wheels.)

the discrepancy is immaterial. The following instructions for using the proposed check gage explains all points in connection therewith:

In using the proposed check gage, if the projections *A* and *B* do not enter between the flanges, and the projections *C* and *D* rest upon the treads of wheels, the wheels should be rejected.

If the projection *A* is pressed against inside of the corresponding flange, the projection *C* resting on the

Your committee desires to urge upon all members of the association the use of the standard maximum and minimum flange gages as a test requirement for all new wheels purchased before fitting them to axles.

In conclusion, it would summarize its recommendation as follows:

First. That a standard reference gage for mounting wheels, covering the standard dimensions, shown in Fig.

and also that car owners be required to stencil size of journal on truck planks; also the numbers and initials of all box cars on floor timbers between cross-tie timbers, begs to report as follows: Communication with the Secretary of the Car Inspectors' Association develops that the reasons for requesting the adoption of their recommendations are:

First. To expedite the movement of freight, especially at night, when it is difficult to read the car numbers and initials where they are located high up on the car side.

Second. To save loss of time in having to measure unusually large cars in order to know whether they will properly clear bridges, tunnels, etc., on the receiving company's line.

Third. To facilitate movements of inspectors in ascertaining proper size of journal bearings or axles in connection with repairs.

Your committee wishes to commend the spirit of interest in the improvement of the service shown by the action of the Car Inspectors' Association, and we believe the suggestions made are good ones and worthy of having the general approval of the M. C. B. Association. There are some difficulties in the way of carrying out literally the proposed stenciling on account of the different contour lines of high cars, and from the fact that some special classes of cars are sheathed over underneath, covering in the sills and floor timbers. We believe, on the other hand, that the recommendations of the Car Inspectors' Association do not go quite far enough in attaining the desired smoothness in handling inspection work at interchange points. Oftentimes it is impossible, for inspectors to tell, in connection with some of the prominent and expensive features of the cars, what is

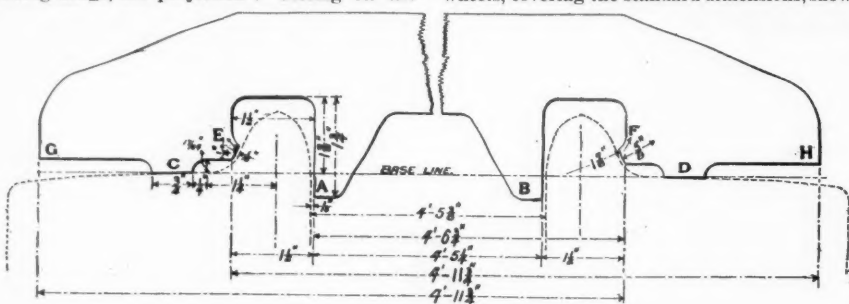


Fig. 2.—Standard Check Gage.

(With Report on Mounting Wheels.)

tread, and the projection *F* does not allow the projection *D* to rest on its corresponding tread, the wheels should be rejected.

Also, if *F* and *D* are pressed against the flange tread of wheel, and *C* does not come in contact with tread on account of *E*, the wheel should be rejected.

If *E* and *C* are pressed against flange and tread, and *H*

1. be adopted, which shall combine the present check gage for mounting wheels, shown in Plate 12 of 1895 Proceedings, and the standard wheel gage shown in Plate 7 of same year, the new combined gage to supersede the other two.

Second. That a standard check gage be adopted as shown in Fig. 2.



the proper standard. It would seem to your committee desirable to a limited extent to cover these points by proper stenciling. Your committee, would, therefore, recommend:

*First.* That on all box cars standing more than 12 ft. from top of rail to eaves, the width at eaves be stenciled in 3-in. letters on side of car, as near the bottom as convenient.

*Second.* That all box, stock and other roofed cars have the number and initials stenciled in 3-in. letters on outer face of outer floor timber between cross-tie timbers, except where cars are ceiled over underneath, in which case the stenciling shall be put on inside face of each cross-tie timber in center.

*Third.* That all classes of cars have style of coupler and rear attachments and style of brakebeams stenciled in not less than 1½-in. letters near one end of car on each side, or on each end of car directly above the buffer blocks where design of car permits it.

*Fourth.* That where the construction of the truck permits, trucks shall be stenciled on each side, giving the size of journal, and the letters "M. C. B." if the axle is M. C. B. standard axle. If the axle is not M. C. B. standard, use dimensions from center to center of journal in place of M. C. B. This stenciling to be 1½-in. letters, and to be put on end or side of bolster in Diamond trucks, and on side-truck frame in center on Fox trucks.

*Fifth.* That on all equipped with air-brakes, the words "Air-brake," in letters not less than 3 in. high, be stenciled on the sides or ends of the cars, and that the make of air-brake equipment be stenciled (in smaller letters if desired) over or just preceding these words, to enable inspectors to detect repairs made with wrong material.

#### HANDHOLDS AND HEIGHT OF DRAWBARS.

(The committee consists of Messrs. H. S. Hayward, S. A. Charpiot, John Mackenzie, J. W. Marden, A. E. Mitchell, C. A. Schroyer, S. A. Crone, Tracy Lyon, W. A. Nettleton, L. B. Paxson and S. Higgins.)

Replies were received from 66 roads and systems representing 909,608 cars out of a total of 1,157,830, and it was found that, with few exceptions, the box and stock cars could be grouped under two general headings, and all flat cars and high and low side gondolas were approximately so nearly alike as to permit one general classification for each type.

The committee submit the following as their decision as to what they consider to be conformity to the requirements of the law in accordance with the "Safety Appliance Act" of March 2, 1893, Section No. 4:

*First.* All box or stock cars with end platforms and end ladders provided with side grabirons or handholds over each step, and two grabirons or handholds located on each end of car. The lower rung of ladder may be considered as taking the place of one grabiron at each end of car.

*Second.* Box or stock cars with end platforms and side ladders and provided with one grabiron or handhold over each step, except where a ladder is located, in which case the lower rung of the ladder will be considered as an available handhold, and two grabirons or handholds at each end of car.

*Third.* All box and stock cars without end platforms, but with end ladders, if equipped with one grabiron or handhold over each step, and two grabirons or handholds at each end of car, the lower rung of ladder may take the place of one grabiron on that side of end of car.

*Fourth.* Box and stock cars without end platforms and with side ladders, if provided with side grabirons or handholds over each step, except where ladder is located, in which case the lower rung of ladder is considered as an available handhold, and two grabirons or handholds on each end of car.

*Fifth.* All gondolas with drop ends provided with grabirons or handholds over each step, and two grabirons or handholds at each end of car.

*Sixth.* All gondolas with fixed ends provided with one grabiron or handhold over each step, and two grabirons or handholds at each end of car, or when provided with brake step the brake-step bracket may take the place of a grabiron on that side of end of car.

*Seventh.* All tank cars that are provided with grabirons or handholds over each step, or when equipped with safety side railings the latter may take the place of a grabiron on side of car, and with two grabirons or handholds at each end of car.

*Eighth.* All flat cars that are provided with grabirons or handholds over each step, or if not equipped with step one grabiron on each side near end of car where coupler unlocking rod is located, and two grabirons or handholds on end of car.

It was also requested by the Executive Committee that this committee should proceed further with this subject and present a uniform recommended practice covering all the various classes of cars. The committee presents the following recommendations, and would particularly call attention to the recommendation for placing all end ladders to the left of the center line of end of car:

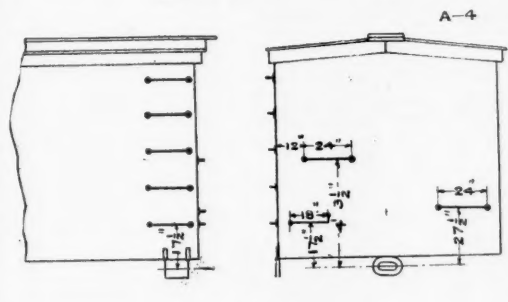
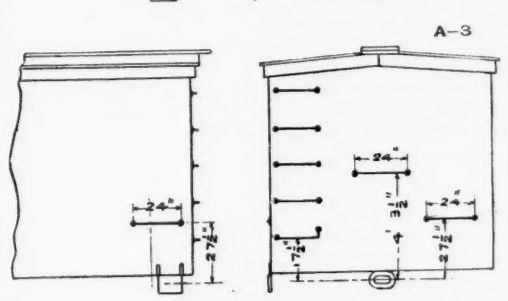
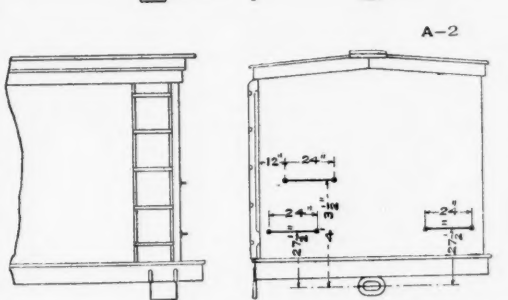
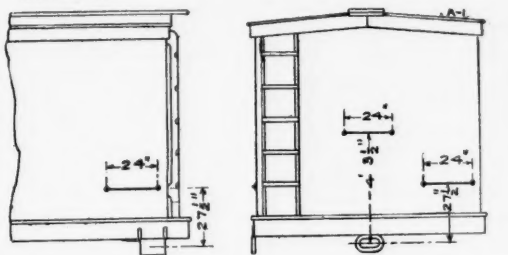
*First.* Box and stock cars constructed with projecting end sills with side ladders should be provided with a horizontal grabiron or handhold 24 in. long on side of car over each step, located 27½ in. above center line of drawbar. The end ladder should be located on left-hand side of end of car and one horizontal grabiron or handhold 24 in. long on right-hand side of end of car 27½ in. above center line of drawbar, the lower rung of ladder being a suitable grab for opposite side of end of car. Where such ladders are located on end of car close to corner post there should be an additional grabiron or handhold 24 in. long, placed horizontally 4 ft. 3½ in. above center line of drawbar and located about the center of end of car, as shown on plate A-1. When ladders are located near the center of end of car the upper grabiron or handhold is unnecessary.

*Second.* Box and stock cars constructed with projecting end sills with side ladders located over steps, the lower rung of such ladders is an effective grab. They should also be provided with two horizontal grabirons or handholds 24 in. long, located on each side of end of car 27½ in. above the center line of drawbar, with an additional horizontal grabiron or handhold 24 in. long, located 4 ft. 3½ in. above the center line of drawbar near center of end of car, as shown on plate A-2.

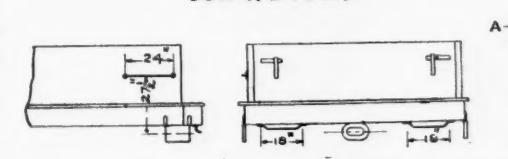
*Third.* Box and stock cars not constructed with projecting end sills with side ladders should be provided with horizontal grabiron or handhold 24 in. long on side of car over each step, located 27½ in. above center line of drawbar. The end ladder should be located on left-hand side of end of car and one horizontal grabiron or handhold 24 in. long on right-hand side of end of car 27½ in. above center line of drawbar, the lower rung of ladder being a suitable grab for that side of end of car. Where such ladders are located on end of car close to corner post there should be an additional grabiron or handhold 24 in. long, placed horizontally 4 ft. 3½ in. above the center line of drawbar and located about the center of end of car, as shown on plate A-3. End ladders that are not constructed with side sills should have the lower rung provided with a guard to prevent the foot from slipping off.

*Fourth.* Box and stock cars not constructed with projecting end sills with side ladders located over steps, the lower rung of such ladders is an effective grab. They should be provided with one horizontal grabiron or handhold 24 in. long located on right-hand side of end of car 27½ in. above center line of drawbar and one horizontal grabiron or handhold 18 in. long located 17½ in. above center line of drawbar and provided with a foot guard, also an additional horizontal grabiron or handhold 24 in. long located 12 in. from left side of car 4 ft. 3½ in. above center line of drawbar, all as shown on plate A-4.

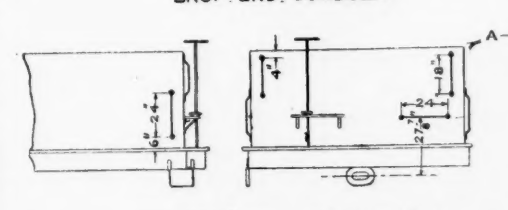
*Fifth.* All gondolas with drop ends to be provided with horizontal grabirons or handholds on sides of car over each step near 24 in. long as practicable, located as high as possible, but not exceeding the measurement of 27½ in. above center line of drawbar, and two grabirons or handholds placed under the sill at end of car as near the face as will insure a good safe fastening, the outside end of it to be in line with the inside face of the side sill and to be 18 in. long with a space not less than three inches between it and the end sill, as shown on plate A-5.



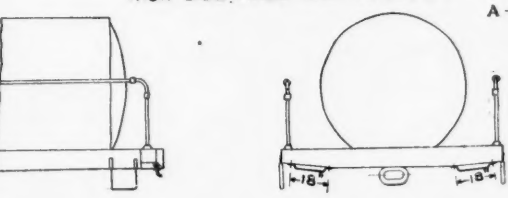
#### BOX & STOCK



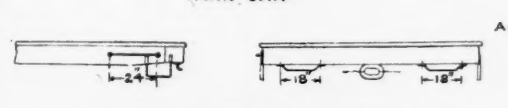
#### DROP END GONDOLA



#### HIGH SIDE FIXED END GONDOLA



#### TANK CAR



#### LOW SIDE GONDOLA & FLAT CARS

(With Report on Handholds, etc.)

*Sixth.* All high-side fixed end gondolas should be equipped with a vertical grabiron or handhold over steps on the sides of the car 24 in. long, the lower end to be placed 6 in. above the floor of the car, and two horizontal grabirons or handholds on each end of car 24 in. long 4 in. from the outside of car and 27½ in. above center line of drawbar, exception to be made where the car is provided with a brake step, in which case the bracket of the brakestep can be used as a grabiron on that side of end of car. It is also recommended that where the side of a gondola car is too high for a man standing on the platform to reach the top there should be two additional vertical grabirons or handholds placed on each side of end of car extending from within 4 in. of the top, to be 18 in. long, all as shown on plate A-6.

*Seventh.* Tank cars should be provided with horizontal grabirons or handholds as near 24 in. long as practicable on sides over steps, but cars provided with safety railings on sides do not require side grabirons or handholds but should be provided with two end grabirons or handholds 18 in. long located on under side of end sill, the same as for drop-end gondolas and as shown on plate A-7.

*Eighth.* All flat cars to be provided with horizontal grabirons or handholds on sides of cars over steps as near 24 in. long as practicable, and if not equipped with step one grabiron or handhold on each side near end of car where coupler unlocking rod is located, and two end grabirons or handholds 18 in. long placed under the sill as near the face as will insure a good safe fastening, the same as for drop-end gondolas and as shown on plate A-8.

It is also recommended that all grabirons or handholds shall be secured by through bolts of ½-in. diameter, with nuts on the outside and riveted over wherever it is possible to do, and where lag-screws are used they shall be not less than ½ in. diameter and 3 in. long and screwed into solid wood.

Your committee was also requested to advise what shop or repair practice would be most desirable in order to have the height of drawbars at all times in conformity with the requirements of the law. While the committee did not have a special meeting to discuss the subject, it was taken up by the chairman in connection with such of the members of the committee as he was able to meet, and it was decided that, owing to the various methods of construction of cars, it would be difficult to recommend a uniform practice. The law itself is explicit, and therefore the only question of any vital importance to be settled was to designate what would be considered a proper method of doing this work for which charges should be made, and that temporary or partial adjustment of cars in order to get them over the road should not be charged to car owners. In accordance with these views, the chairman of the committee addressed a letter to the president of the Master Car Builders' Association on Feb. 6, 1896, recommending that a meeting of the Executive Committee should be held and such instructions as were desirable issued, to prevent any complications in charges between the various roads. This meeting of the Executive Committee was held in Buffalo, New York, Feb. 12, 1896, and a series of resolutions were adopted which were issued by the secretary under date of Feb. 13. The result has been that comparatively little trouble has been experienced in connection with the height of drawbars at various interchange points throughout the country, and the action taken by the Executive Committee has fully covered all the requirements, as there is no doubt that all car owners have taken the steps necessary to bring their cars to the proper height, and consequently but little trouble is now being experienced.

#### LOCATION OF AIR-BRAKE CYLINDERS ON FREIGHT CARS.

(The committee consists of Messrs. Jas. Macbeth, Robt. Gunn, H. C. McCarty, B. Haskell, F. B. Griffith, A. C. Robinson and Joel West.)

On the basis of 1,210,000 freight cars in service approximately one-third of this number are now equipped with air-brakes. Experience has demonstrated, at various inspection points, that 55 per cent. of the freight equipment interchanged is equipped with air-brakes, owing to the fact that a large percentage of cars equipped with air-brakes do not leave the line of some companies owning the same. This clearly emphasizes the volume of work for the proper maintenance of the brake, and also the additional duties to the inspector and repairing force. It is therefore apparent that the air-brake cylinders and triple valves should be located in such a position that the attention they require can be readily and safely given, causing the least possible delay to traffic, and result in maintaining the brakes in the most efficient manner. The committee would therefore make the following recommendations:

Air-brake cylinders and reservoirs should be placed on cars on a line inside of stake pocket as near center of car as possible. A clearance of at least 12 in. should be allowed for the removal of cylinder head.

Special attention is called to this point, as a number of railroads are now locating cylinder in a position which brings cylinder head within 4 or 5 in. from needle beams or other parts of car, preventing, without great difficulty, the removal of head.

The main air pipe should be located as near the outside line of side sill as possible. This will enable the men to readily reach and clean the drain cups in main air pipe, and will also place the pipe in a position on gondola cars where the least possible injury will be caused by the dripping of water on pipe after having passed through bituminous coal that cars may be loaded with.

The cut-out cock should be located under the car near the center, where it can be reached from either side, and be subject to the least interference by irresponsible parties, which already has developed.

Air-brake branch pipe should be connected to top of drain cup in main pipe instead of bottom, in order to avoid, as far as possible, the tendency of dust and dirt to pass through strainer to triple valve.

Release valve should be placed on top of reservoir and handle extended to each side of car.

When necessary to provide holes in needle beam or other parts of car to accommodate rods or levers, the committee recommends that they be made sufficiently large to allow ample space for the operation of rods or levers, as it has already been found that openings provided have been so small as to prevent rods from moving.

Rods should be parallel with line of car, as far as practicable, and properly supported with hangers, to avoid binding and breaking of piston sleeves.

The committee received, after its appointment, a communication from the secretary, stating that it was the desire of the president that it also take up the question of, and incorporate in its report, a method of marking hose, so that the lifetime and service of hose could be more carefully and intelligently followed up.

It is known that some of the leading manufacturers are now marking the hose they manufacture. Their plans were considered, together with additional points that the committee considered essential, in order that the highest uniform degree of efficiency may be reached in hose, and would therefore recommend the marking as shown on accompanying cut.

(CONTINUED ON PAGE 436.)





ESTABLISHED IN APRIL, 1856.  
Published Every Friday  
At 32 Park Place, New York.

#### EDITORIAL ANNOUNCEMENTS.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Railroad gross earnings in May show a smaller percentage of increase as compared with the previous year than any other month this year. As reported by the *Financial Chronicle*, roads operating 95,647 miles earned \$37,524,000, an increase of 2.28 per cent. In March the percentage of increase was 4.42 per cent, and in April 3.41 per cent. In fact, the May earnings this year make a less favorable comparison with the corresponding totals of the preceding year than those of any month since last August. Until March larger earnings were being constantly reported, and the percentages of increase rose until, in January, we had an increase of 11 per cent, and in February an increase of 14 per cent. This was the second largest monthly increase which had been reported for four years. The comparisons, it should be noted, however, are now being made with better earnings in 1895. The increase last year in May was \$2,361,000, or 6.4 per cent., as compared with a loss of \$7,782,000, or 17.5 per cent. These unfavorable earnings for three successive months show how serious and widespread the restriction in business is. It is shown also in another way. Bank clearings, a very quick and certain index of business conditions, fell off about 13 per cent, last month, and pig iron production continues to decrease, the capacity of blast furnaces, according to the *Iron Age* reports, being 182,000 tons, as compared with a capacity of 216,000 tons on December 1 last. Though the total earnings of the roads reporting in May show an increase of \$834,000, nearly half of the companies report a decrease. Moreover, if we eliminate the increase reported by four companies, \$916,000, it will be seen that there is an actual decrease. These four companies are the Norfolk & Western, which gained \$347,000 in the month, traffic in 1895 having been interrupted by a miners' strike; the Canadian Pacific gained \$256,000, the Great Northern, \$199,000 and the Chicago, Milwaukee & St. Paul \$113,000. The last three companies gained through the movement of spring wheat in the Northwest. No other group of roads shows any increase. The roads in the South and Southwest had about the same amount of cotton to carry as last year. Receipts at ports were 108,952 bales, against 116,225 in 1894. The overland shipments were 71,701 bales as, against 63,705 bales. The grain movement, which so far this year has been large, has fallen off enough to affect adversely the earnings of many roads. Wheat receipts at Western primary markets during the four weeks of May were 7,588,000 bushels in 1896 and 6,419,890 bushels in 1895. But Duluth receipts increased 2½ millions, which is reflected in the earnings of the Northwestern roads. It will be noticed that but for this movement to Duluth, the decrease in wheat shipments would have been larger. Receipts of corn and oats also fell off, the former 2½ million bushels, and the latter about two million bushels.

Our criticism of the American Railway Association's block signal rules, printed last week, dealt chiefly with the wording and arrangement of the rules; but it is highly desirable that the substance of

some of the rules—in other words, the practice which they are made to regulate—be discussed, and rule 317 (now 617) is one of those on which light is needed. The committee submits two rules for conducting a train past a stop signal, one authorizing the signalman to wave a flag from the window of the tower and the other requiring him to hand a card to the engineman; and either method is, in the belief of the committee, good practice. This belief is well founded, for both methods have been used for years with success on first-class roads; but why not find out which of the two is best? Why not get the full benefit of a committee like this, by instructing it to endeavor to unify practice in such an important detail? This function of signaling has to do, not with freight trains alone, as is generally the case with permissive blocking, but with fast passenger trains. The advocates of both practices ought to be ready to give a reason for the faith that is in them, and they should be invited to do so. If cards are unnecessary the delay incident to their use ought to be avoided. If flagging is dangerous, those who thus think ought to be able to explain why it is so. If flagging is permissible under some circumstances but not under others, let us have the different circumstances described.

It is much to be regretted that the special committee saw fit to change the numbers of the rules in the Standard Code. Rule No. 99, now made familiar by nearly 10 years' discussion, becomes 399, and No. 510, another important one, becomes 460; the others suffer corresponding alterations. The change is not of sufficient importance to justify weeping over it, for nothing is more patent to the observer of American railroad practice than the facility with which the great majority of the men can adjust themselves to inconvenient surroundings and get over all sorts of difficulties; and this is a minor difficulty; but the statement of the committee that it was absolutely necessary to make a change seems incredible to those who have not heard the reasons for the change (and none were given at the convention). If every rule were shoved along just three even hundreds and that were all, there would be less objection; but the train order rules are set back instead of forward, and the old numbers of the other rules are, by the plan, to be used in a new department of the code, that containing "general regulations." These general regulations have already been reported once (October, 1894), numbered in a series beginning with 600. What harm would there have been in leaving them that way? Half the value of the standard code is in the added facility of discussing the rules—in round-houses and elsewhere—and facility depends much on that familiarity with the rules that comes from knowing their numbers without looking on the book.

If every car-record officer in the country can be made to keep constantly in mind the fact that all his work and annoyances connected with the care and distribution of furniture cars are due to a vicious practice in the rate-making department, we may hope that he will maintain a sufficiently active feeling of indignation to lead him to remonstrate against the illogical method of the traffic men, whenever and wherever he can get a chance; and the Association of Car Accountants, whose convention we report in this issue, is, therefore, to be commended for keeping up the discussion of the large-car evil, whether much progress is made or not. From the car-superintendent's standpoint, material progress has already been made, for a change for the better in the rates on 400 commodities is an important improvement. Whether or not these reductions in minimum weights are immediately profitable to the railroads is another question, though it is to be answered, we presume, in the affirmative in most cases. The original evil was in the adoption of fictitious weights in the first place (instead of raising the rates) and even if a reformation does cost something it will probably pay in the end. The question of the right basis for settling for freight cars hired by one road from another is another subject on which the car accountants, we are glad to see, keep up their courage and keep up discussion. The clear-headed members of this Association faithfully keep uppermost the main argument for the per-diem plan, namely, that that plan will enable the car accountant to settle his accounts with the roads that use his cars from the information shown in his own books instead of accepting a blind statement given by other roads from their own records, which, in at least one marked instance, it seems he is not allowed to check. The other consideration in favor of the per-diem theory, that it will improve the movement of cars and give the railroads a freer supply, is highly important, but by the car accountant is rightfully considered secondary to this first great feature,

of a sure check on the revenue which is due him. How long are the railroads of this country going to tolerate the present wasteful plan?

At Albuquerque, New Mexico, according to a press despatch, Judge Collier has ordered the Receiver of the Atlantic & Pacific not to blacklist any member of the American Railway Union. We doubt the accuracy of this despatch. The term "blacklist" is used by the reporters nowadays with great freedom, but instances of actual blacklisting, which is sending an employee's name by one employer to another employer, with an expressed or implied statement that the employee is objectionable or undesirable, are as hard to find as instances of pooling, which the newspapers are all the time talking about, but which never are shown to exist. We have read of one or two convictions of division superintendents in minor courts on a charge of some kind of oppression of an employee; and we do not know but the fault was actually blacklisting, in one of these cases; it would not be strange if here and there a superintendent could be found so lacking in judgment or in consideration for ignorant or misguided strikers as to go out of his way to warn other roads against applicants who would demoralize the forces of any road they worked for; but the existence of blacklisting to any extent worth mentioning is extremely unlikely, for two reasons: the road furnishing the list gets no benefit from it, and the road receiving it has better means of information about the character and antecedents of applicants for employment. Moreover, in the superabundance of help that has prevailed everywhere for the past three years, every road can find men enough about whose record there is no doubt, so that reference to lists for possible flaws in men's records in former years is a waste of time. Under these circumstances the friendship of a superintendent for other railroads is not likely to be so warm as to lead him to incur the risk of a legal prosecution for manifesting it, and in hiring men for his own road the plainest dictates of common sense will teach him to depend, for information not available from nearer sources, upon letters of recommendation from known railroad officers. If a man claims to have had experience on other roads, failure to produce a letter is generally a sufficiently black fact and there is no need of referring to any list. Probably the New Mexico judge has merely ordered the Receiver not to discriminate against members of the American Railway Union in hiring new men. That is good law, no doubt; and ordinarily the rule not to discriminate against brotherhoods is good common sense also. But Debs' organization is so much "below grade" that it is hard to class it with those managed by men of good intentions, and it seems strange to hear that there are still enough men in the West belonging to it to make it worthy of notice in court. We cannot imagine that the decision will hamper the Receiver, for any man who still pins his faith to Debs must have qualities that indicate his undesirableness, aside from his membership or non-membership in the union. His lack of level-headedness must stick out all over him, so to speak.

#### The Work of the Brake Shoe Test Committee.

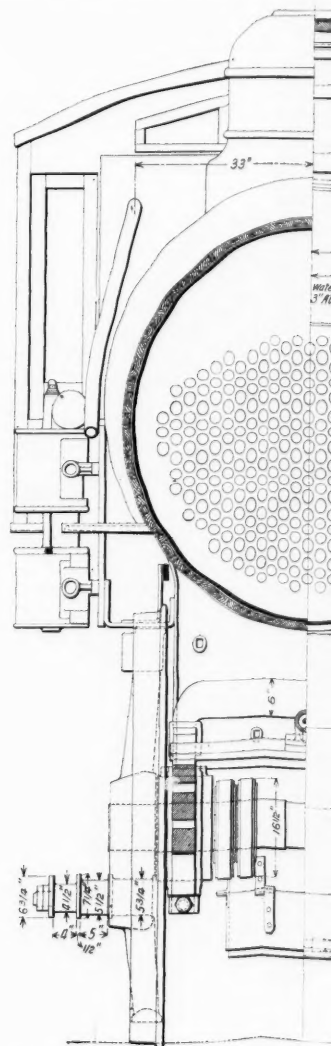
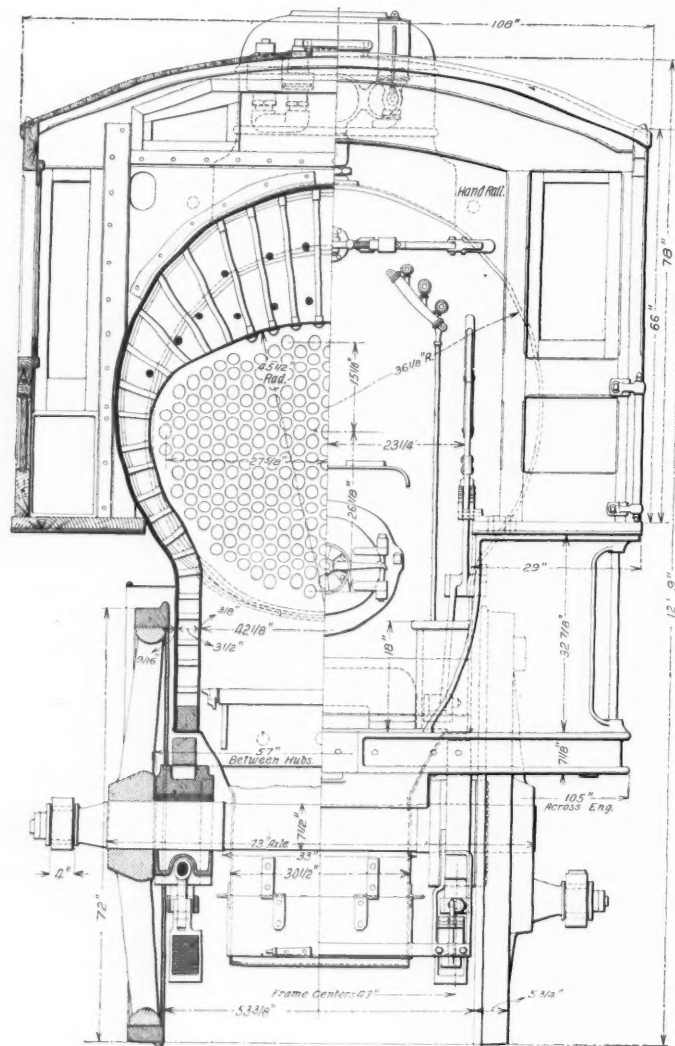
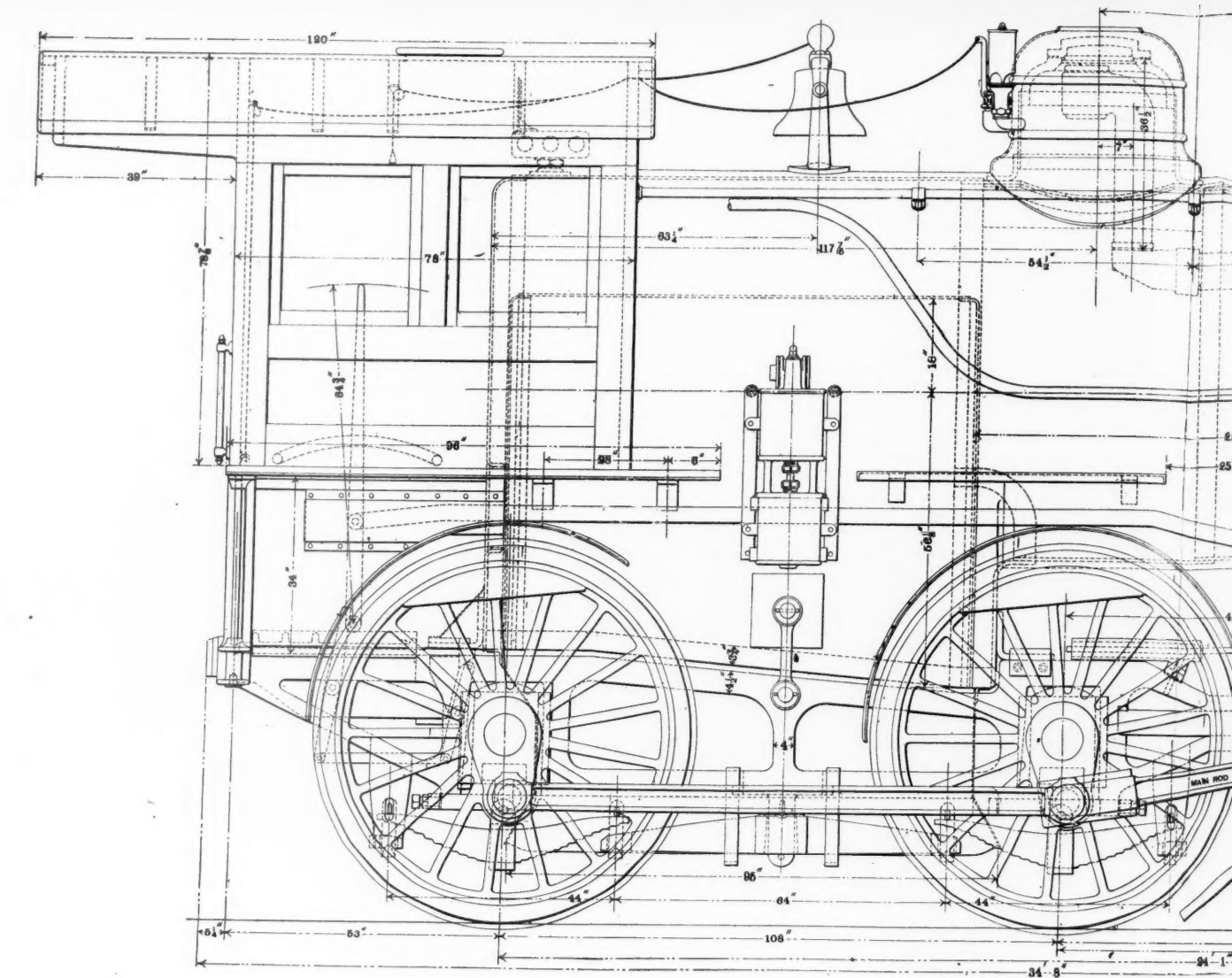
In 1893 the Master Car Builders' Association appointed a committee to make laboratory tests of metals for brake shoes. The instructions read, "To conduct and report upon laboratory tests of different brake shoes with as complete data as possible." In 1894 the committee reported progress and gave drawings of the machine they proposed to use. Thereafter in that year and in the early part of 1895, a series of tests were made and the results given to the convention at Alexandria Bay in June of last year.

The machine consists mainly of a long horizontal jack shaft, divided into two sections by a clutch which can be thrown on or off as desired. One section of the shaft is driven by a belt from a stationary engine of the Westinghouse type. This section, by means of the clutch, drives the other section on which is placed a large fly wheel. The inertia of this wheel represents the stored energy in that part of the mass of a heavy passenger car which rests on one axle. On this shaft is placed a chilled or steel-tired wheel which is forced to revolve after the brake shoe is applied by the stored energy in the large fly-wheel. The fly-wheel is kept from bursting by four blank steel tires shrunk on the outside.

By means of suitable levers and weights the different kinds of brake shoes are made to bear on top of the wheel. To the brake head is attached a horizontal rod leading to a dynamometer of the Emory type, which records accurately by a graphical method the pull on the brake rod exerted by the brake shoe. The paper on which the graphical record is described is







EXPRESS PASSENGER LOCOMOTIVE—BOSTON

Mr. H. BARTLETT, Superintendent of Motive Power.









made to travel in proportion to the number of revolutions of the wheel on which the brake shoe is placed. This is done by means of a belt connection. On the diagram is also given a series of marks  $\frac{1}{2}$  second apart, the recording pencil being actuated by clock work. A sample diagram taken from a cast-iron shoe is given. The length of the card described is approximately in proportion to the number of revolutions of the car wheel during the stop. The height of the card is a direct measure of the pull on the brake rod, and the distance between the individual second marks indicates the speed of the paper which has a fixed proportion to the speed of the car wheel.

In this way the diagrams give pretty accurately the average pull on the brake rod, the speed at which the brake shoe is applied and the number of revolutions of the car wheel during the stop. The only appreciable errors that can enter into the measurement of the mean pull on the brake rod are those arising from the calibration of the machine. The only discrepancy in the speed measurement is that from the motion of the paper. In the case of the length of the diagram there is a chance for a considerable error, owing to the energy that is absorbed by the bearings of the shaft on which the fly-wheel rests.

It is evident there are two forces acting to stop the car wheel in this apparatus: one is the friction of the brakeshoe and the other the combined friction of the bearings of the shaft on which the fly-wheel is mounted. The friction of oiled bearings, arranged in this way, will vary from three to ten per cent. These limits have been confirmed by friction tests made with this device. This range of seven per cent. in friction might cause the length of a stop to be decreased or increased by 10 per cent., or even 25 per cent. in extreme cases, depending upon the perfection of the

The results obtained last year and given in the committee's report will be found in the *Railroad Gazette*, June 21, 1895. A summary of the results, with two exceptions, is given in the table on another page. The exceptions are the results of the test of the soft and hard open-hearth steel at 40 miles an hour, which have been re-run this year to learn if the maximum coefficients had been obtained. It has been found that some changes should be made in these two items and these will be given in the committee's report this year, together with some additional tests of new forms of shoes. The figures in italics show the new results for the steel shoes at 40 miles an hour. It is expected the committee will also report upon the effect of the 17-in. as compared with a 13-in. shoe.

Perhaps the most important and useful conclusion that will be given this year is that relating to the effects of an increase of pressure and speed on the average retarding effect of a brake shoe. A fair idea of the effect of an increase of speed on the average retarding effect of a brake shoe during an emergency stop is given by Fig. 2. These diagrams have been superimposed and show the results directly by comparison. This test was made with a soft, cast-iron shoe bearing on a steel tire with a pressure of 6,750 lbs. The shoe was of the M. C. B. standard 13-in. size.

The comparative lengths of the diagram on Fig. 2 represent approximately the comparative length of the stops that would be obtained in service under similar conditions. The following are the calculated results:

Speed in miles an hour.	Average coefficient of friction. Per cent.	Maximum coefficient of friction 15 ft. from the end of the stop. Per cent.
65	16.8	29.0
40	25.5	33.0
30	25.7	35.3

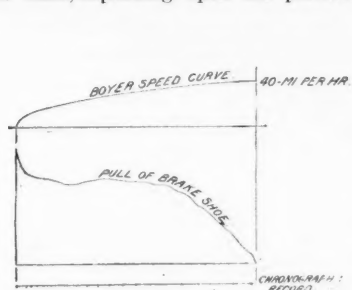


Fig. 1.

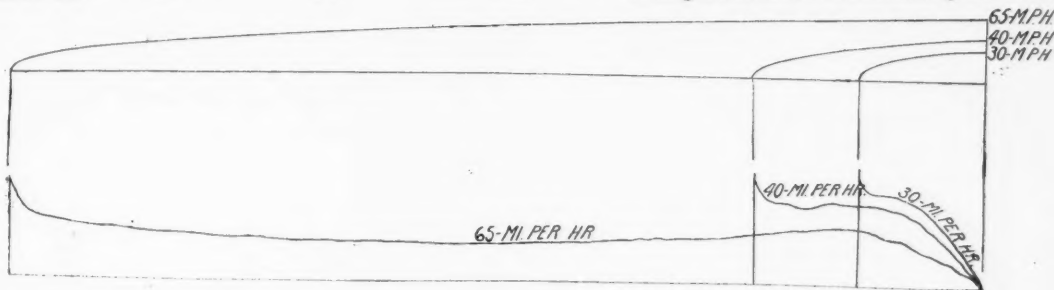


Fig. 2.

lubrication. This variation might occur with the same shoe, and with the same initial speed and pressure on the shoe. It is for this reason that the length of the stops given in the committee's report under the head of "Travel of Wheel in Feet" is not considered of any particular value. The design of the machine was intended to remove all important errors from the determination of the co-efficient of friction, which is the mean height of the card divided by the pressure on the brake shoe, and to throw unavoidable errors into the measurement of the length of the stop.

It has been found by experiment with this machine, when all the conditions appear to be the same, that owing to the wide variation in the co-efficient of friction high accuracy of measurement is of no particular importance, and that the Emory device has no special value for this work. In fact the violent jarring and shaking arising from the chattering of the brake shoe has so affected the delicate measuring device as to give rise to continual repairs, which have delayed the work considerably.

The variations in the co-efficient of friction occurring from hour to hour between consecutive tests are to be explained by the irregularities of surface which arise from the grinding of two metals on each other under heavy pressure. The co-efficient of friction between metals has been the subject of much investigation and invariably the same irregularity has been found. The only agreement that is really satisfactory between the different results obtained is found in the maximum co-efficients; the average and the minimum co-efficients of unlubricated surfaces, as determined by different investigators, differ widely and depend perhaps more upon the number of tests made than upon the conditions; that is, a large number of tests made under conditions which give low co-efficients of friction averaged with a small number made under conditions which give high co-efficients result in a low average. Therefore it is conceivable that the highest co-efficient, or maximum result, is the most satisfactory to argue about, for the upper limit to the friction between two metals is apparently well defined, while it is equally apparent that there is no well-defined minimum limit. For these reasons it is clear that no average of low and high co-efficients can be given that would really mean anything.

The stored energy in a train varies as the square of the speed, hence the ratio of the energy to be taken out of the train in the two extreme cases in point is: 4.7 to 1, taking the 30-mile case as a basis. The ratio of the average coefficients of friction are  $\frac{16.8}{25.5}$  to 1. While these results have been taken at random and are not therefore strictly comparative, as the coefficients of friction may not be the maximum ones, yet the example is a fair illustration of the point being made. The stored energy in a train is 4.7 times as great at 65 miles an hour as at 30 and therefore there is 4.7 times as much work to be done by the brakeshoes and with this greater duty required the brakeshoes are only about two-thirds as efficient. This reduction in the stopping power is due solely to the speed. There is a further reduction if the pressure on the shoes is increased as it is for heavy cars. The maximum brake-shoe pressures used for cars in service, so far as it is apparent at this time, is that used by the committee last year in the high speed tests, or 10,733 lbs. The average pressure per shoe in freight service is not far from 2,798 lbs. This wide difference in pressure causes a large change in the average coefficient of friction during a stop and an important change in the coefficient within 15 ft. from the end of the stop. This fact will be illustrated by diagrams in the committee report this year.

There are then two conditions of passenger service which reduce the coefficients of friction below those found in freight service, these are: Higher speed and a greater pressure on the shoe. Anyone watching the machinery during these tests could not fail to be impressed with the real reason for the reduced friction. When the shoe is applied to the wheel with a light pressure at a slow speed there are little heating and practically no sparks. The condition may be described as a cold metal rubbing on another cold metal with small cold particles of each between the two. But when the shoe is applied with four times this pressure and at twice the speed the greater amount of work done per second causes much heating and the condition becomes that of a red hot metal (the shoe) bearing on a warm metal (the wheel) with liquid metal from the shoe between the two. If the metal between is not liquid it is at least plastic and reduces the friction fully as much as might be anticipated. These are matters that affect

the safety of trains and therefore are perhaps of more importance than any of the other results of the tests.

One naturally inquires, how can the breaking power be increased if an increase of pressure reduces the coefficient of friction? The reply is that although the coefficient of friction is reduced the total friction is greater. Thus an increase of pressure of four times might only decrease the coefficient of friction, say one half, leaving a result of twice the total friction for four times the pressure. It has been proposed to use two shoes per wheel so as to reduce the pressure per shoe. But this cannot remove the loss of average friction arising from the greater speed. It is evident that the loss from greater speed can only be made good by using greater pressure at the higher speeds and using two shoes if necessary to reduce the rapid wear of a single shoe which arises from the heating.

This is a conclusion that was reached long ago by the Westinghouse Air-Brake Co., and led to a trial of higher pressures at higher speed. The trials gave slid wheels in such large numbers that railroad men did not take kindly to the plan proposed, which was to let the pressure in the cylinders leak off during the stop. The value of the shop-test committee's work rests mainly on the fact that it places actual values on the coefficients of friction that have been talked about before, and gives people a chance to make some useful calculations about the limits of the conditions to be met.

It is pretty clear that the most practical way of increasing the retarding effect of brakeshoes at the higher speeds and pressures is to make a still further increase of pressure and use two shoes per wheel when the pressures become too great for one. Owing to the curling of the shoe with the heating it does not appear

that a shoe much longer than the 13-in. now used will be of any practical value in giving a larger area of shoe against the wheel.

The limiting condition to an increase of total shoe pressure per wheel is, of course, the sliding of the wheels on the rails, and on this point the committee have collected some useful data. It has been supposed that the friction of brakeshoes near the end of the stop was practically the same no matter what the speed at which the shoe was applied at the beginning of the stop. The work of the committee shows that this is not the case, and that the friction of the shoe near the end of the stop is much less for higher speeds and pressures. Take the results given by the committee last year as an example: With 2,798 lbs. pressure and 40 miles an hour the friction near the end of the stop was 42 per cent., while with 10,733 lbs. and 65 miles an hour it was but 21 per cent. This indicates that a greater pressure can be maintained on a brake shoe throughout the entire length of the stop, when the initial speed and pressure on the shoe are increased, without sliding the wheels near the end of the stop. This undoubtedly arises from the plastic condition of the face of the shoe or the particles between the shoe and the wheel.

It is in this way that the committee on shop tests have laid the foundation for approximate analysis of the actual conditions of service, and from this point progress in gaining more control of high speed should be rapid. Lack of data has kept the whole matter in the condition of speculation, but now every railroad can make rough calculations which will give the probable limits of service conditions. For instance, take the case of slid wheels: It is common experience that a soft cast-iron shoe, 13 in. long, can be applied to a wheel at any speed with a calculated pressure equal to 90 per cent. of the pressure of the wheel on the rail without sliding the wheel under any but the most unusual conditions of service. It is also common knowledge that this pressure cannot be increased much without causing a large increase in the number of slid wheels. The word "calculated" is in italics to emphasize the fact that the real pressure of the shoe on the wheel is not known owing to uncertain losses in the friction of the parts of the brake gear. However, it is safer for all present practical purposes to use the calculated pressure and assume



the per cent. of loss in the brake gear to be the same for any two shoes or pressures being compared.

Now the friction of a soft cast-iron shoe at 15 ft. from the end of the stop—this having been taken as the limit of permissible sliding—is 42 per cent. when applied at 40 miles an hour and with a low pressure, as shown by the committee's results. It is evident, then, that there will not be much danger of sliding the wheels in any case where the total retarding effort is not more than 42 per cent. of 90 per cent. of the pressure of the wheel on the track. This is 37.8 per cent. of the pressure on the rail. Examining now the results at 65 miles an hour and 10,733 pounds pressure, it is found that the friction is but 21.3 per cent. near the end of the stop, or only about one-half. Hence one might reasonably conclude that with this higher pressure and speed the pressure on the shoe at the end of the stop could be nearly doubled without running any more danger of sliding the wheels than with the less pressure at lower speed.

A number of useful calculations are suggested by the excellent results from the shop tests, and the report adds materially to the knowledge of the friction of metals at decreasing speeds and different pressures.

The committee appointed to make road tests of brake shoes to determine the wear and action under practical conditions reported finally last year, and were ordered to act this year with the shop-test committee in making final accommodations to the association. One meeting was held at Pittsburgh, at which the principal brake-shoe manufacturers attended. The second and final meeting was at Saratoga this week. The recommendations have not been received at this writing.

The decision of the Supreme Court of the United States in the contention between the state of Illinois and the Illinois Central Railroad concerning the stopping of the fast mail train at Cairo, which was briefly reported in the *Railroad Gazette* of May 23, does not touch the most interesting phase of the question. The decision, prepared by Mr. Justice Harlan, is brief, and simply holds that to require a fast mail train to go  $3\frac{1}{2}$  miles out of its way, making 7 miles additional travel, is an unnecessary interference with the speedy and uninterrupted carriage of the mails, and cannot be considered as a reasonable police regulation. The state may make reasonable police regulations, to secure the safety of passengers, even on interstate trains, but it must not burden or impede interstate traffic. The question whether a state might by law require an interstate train to stop at a county seat without going out of its course is not presented in this case, and, of course, the Supreme Court takes care not to express an opinion on the point. The Illinois law requires all regular passenger trains to stop at the railroad station of county seats. The road argued that this phrase, taken with the context, meant that each train must "stop upon its arrival" at a station, and that no part of the law required any train to arrive at or to go to any particular station. It appears that the junction of the short Cairo branch with the main line is within the limits of the city of Cairo, and this might be considered as being at a county seat, but the Supreme Court avoids the discussion of the strained construction by which the law would be held in this case to require the train to make a side trip of  $3\frac{1}{2}$  miles, holding that the construction put upon the act by the Supreme Court of the State should stand; it does not involve any Federal question and the constitutionality of the statute is therefore accepted. Thus it appears that if the Chicago-New Orleans train were not an interstate train the road would have to put up with the absurd requirement of the law. (Whether the Supreme Court would assert the right of the Federal Government with equal decision if this were a mail train, but not interstate, does not appear.) The beauty of a law of this kind may be imagined by considering how it would work if applied, say to the Empire State express. According to the view of the Illinois legislature, backed up by the Supreme Court of that state, this train, running wholly within one state, and carrying no mails, might be required to break its journey, say, at Rochester, and make a side trip to Charlotte, a few miles north on the shore of Lake Ontario, and the Supreme Court of the United States would not interfere.

It is interesting to learn that certain "Yankee notions" are to be tried on a rather important scale on one of the great English lines of railroad travel. The companies working what is known as the East Coast route, that is, the Great Northern, the North Eastern and the North British, are about to put in service two complete trains made up very much on American ideas. These are for the daylight run from London to Edinburgh and other Scottish points. Each train consists of eight coaches carried on six-wheel trucks. These coaches have the clerestory roof, Gold steam-heating apparatus, Gould combined vestibule, coupler and buffer, and also the Westinghouse quick-action brake. The cars are lighted by gas, and have a complete arrangement of electric bells for calling attendants. Externally they are said to be handsome and indeed striking. They bear the joint coat of arms of the East Coast companies in the middle, and at either end the old coat of arms of England and Scotland. Each train carries one

third-class open carriage entered at the ends, with a center aisle. This seats 54 passengers, and is provided with lavatories, a luggage compartment and an attendants' room. There is also on each train a third-class corridor carriage having nine separate compartments. The composite corridor carriages are made up of first-class and third-class compartments, with separate lavatories for each class. Externally these trains must resemble very closely the handsomest trains seen in America, and it will be worth while to see if the use of hook couplers of our M.C. B. type, vestibules, end platforms and quick-action brakes makes headway in English practice as the result of this experiment. We do not pretend to judge whether or not they ought to prevail for English long-distance traffic, for each country has its own conditions, and presumably the intelligent and enterprising men who direct the railroads of each country have developed their practice along the lines that are most useful and profitable.

We regret to find that two or three paragraphs in our report of railroad legislation in the State of New York, which was printed June 5, page 389, are misleading. The bill (No. 740) concerning heating makes no change in the general policy of the State as embodied in the former law, the present act being simply a minor amendment affecting only one car, that of the United States Fish Commission. The State Railroad Commission is to have no new employees except the electrical expert. Candidates for this office will have to undergo a competitive examination under the civil service law. The bills (Nos. 1429 and 1430) referring to air brakes and automatic couplers simply relieve coal jimmies from the operation of the law.

#### TRADE CATALOGUES.

*Vauclain System of Compound Locomotives.*—The Baldwin Locomotive Works have issued a new pamphlet describing the Vauclain system of compound locomotives. The pamphlet can be had on application to Messrs. Burnham, Williams & Co., Philadelphia, Pa. It has been entirely rewritten and contains numerous cuts not hitherto published. It is a handsome pamphlet of 80 pages, octavo, and contains a good deal of interesting and useful information. A list is given of the companies to which the Vauclain compound has been furnished and the number of engines furnished to each of these companies. We find in this list 84 different railroads working in 11 different countries, and the total number of engines footed up 615. The first was built in 1889 and in 1890 three were built. The largest output was in 1892—namely, 213. In 1893, 1894 and 1895 the output naturally fell off, as did all locomotive building, but up to Feb. 20, 1896, the engines built and orders received for 1896 amounted to 73 in number. About a month ago we were told that the total orders had reached 688. Probably this included cylinders furnished for converting simple engines.

The pamphlet begins with a description of the cylinders, with illustrations showing the arrangement of cylinders and valves and the course of the steam. The next chapter is on operation, and tells briefly how the engine should be handled. There is a short chapter on repairs, pointing out the peculiarities of the system. Another chapter discusses the economical advantages, and gives some instruction as to the method of investigating the efficiency of the mechanism. This contains a useful note on the method of combining indicator cards furnished by Mr. George H. Barrus. A chronological statement is given of the general results of comparative tests of Vauclain compound against simple expansion locomotives. This begins with a test made by Mr. John Hickey, of the Northern Pacific, in 1891, and comes down (in date) to tests made in August, 1894, by Mr. Fulton, Locomotive Superintendent of the Wellington & Manawatu Railway in New Zealand. Very well executed half-tone engravings are given of many different engines.

#### The Master Car Builders' Convention.

(Continued from page 433.)

The number of months' guarantee was omitted, as in the opinion of the committee this is a question between the railroad purchasing and the manufacturer, and by requiring that all hose be plainly marked with the initial of the road purchasing and manufacturer's trade mark or name, and also a time guarantee, the character and service of the hose can be readily followed up, and



such hose, with a very limited time guarantee, will soon develop to the purchaser and manufacturer its inferiority or superiority compared with other hose. Size of letters and figures to be not less than one-quarter of an inch.

The committee in these recommendations, has endeavored, as far as possible, to cover this important subject, and at the same time to recommend a method covering the maintenance of same, that would appear most beneficial in all respects, and bring about a uniformity that would overcome the trouble and expense experienced by all concerned.

SUPERVISION OF STANDARDS AND RECOMMENDED PRACTICE.  
(The Committee consists of Messrs. R. H. Soule, G. L. Potter and A. M. Waitt.)

#### STANDARDS.

1. *Journal Box and Details for Journal*  $3\frac{3}{4} \times 7$  in.—On Sheet 1 eliminate all illustration of the dust guard and insert in the dust guard space a note as follows: "This space to be filled with a suitable dust guard."

On Sheet 1 add a note near the hinge pin as follows: "A rivet or nut may be used instead of a cotter, if preferred."

On Sheet 2 insert in the dust-guard space a note as follows: "This space to be filled with a suitable dust guard."

On Sheet 3 add a note as follows: "The lid spring may be of any design and may be secured to the lid by any practicable method, provided that the designated section ( $2 \times \frac{3}{4}$  in.) is adhered to."

On Sheet 3 add a note as follows: "Skeleton wedges of malleable iron or steel may be used, provided the essential dimensions are adhered to."

On Sheet 3 add near the hinge pin a note as follows: "A rivet or nut may be used instead of a cotter, if preferred."

On Sheet 3 show the side lugs of the brass as being  $1\frac{1}{2}$  in. long (instead of 1 in. long, as now). It is reported that these lugs are too weak and break off in service.

2. *Journal Box and Details for Journal*  $4\frac{1}{2} \times 8$  in.—On Sheet 4 eliminate all illustration of dust guard and filling block and insert in the dust-guard space a note as follows: "This space to be filled with a suitable dust guard."

On Sheet 5 insert in the dust-guard space a note as follows: "This space to be filled with a suitable dust guard."

On Sheets 4 and 5 remove the arch-bar seat lugs and make the arch-bar seat  $4\frac{1}{2}$  in. wide.

On Sheet 6 add a note near the hinge pin as follows: "A rivet or nut may be used instead of a cotter, if preferred."

On Sheet 6 add a note as follows: "The lid spring may be of any design and may be secured to the lid by any practicable method, provided that the designated section ( $2 \times \frac{3}{4}$  in.) is adhered to."

On Sheet 6 add a note as follows: "Skeleton wedges of malleable iron or steel may be used, provided the essential dimensions are adhered to."

On Sheet 6 show the side lugs of the brass as being  $1\frac{1}{2}$  in. long (instead of  $\frac{3}{4}$  in. long, as now). It is reported that these lugs are too weak and break off in service."

6. *Distance between the Racks of the Flanges of Car Wheels.*—This matter will, no doubt, be considered by the Committee on Mounting Wheels, although it is not probable that that committee will recommend any modification of the standard distance of 4 ft. 5 $\frac{1}{2}$  in. between the racks of mounted wheels.

8. *Brake Head and Shoe.*—On Sheet 8 modify the designs of brake head and shoe so as to secure increased clearances at ends of shoe and equal clearances (the present clearances are not equal) both above and below the central lug on back of shoe; add brackets to support lower bridge lug of brake head similar to the brackets already in use to support the upper bridge lug; alter the taper of the shoe so that it will correspond to the taper of the tread of wheel; this can be accomplished by increasing the thickness of the inner edge of the shoe from 13-16 in. to 15-16 in., the thickness of the outer edge of the shoe remaining 17-16 in., as now. The committee submits a revision of Sheet 8, embodying the above-mentioned changes, together with some few minor changes suggested by convenience in foundry practice.

10. *Air Brake—General Arrangement and Details.*—The text now reads: "All pins turned to 1 $\frac{1}{2}$  in. in diameter"; alter it to read: "All pins to be 1 $\frac{1}{2}$  in. in diameter"; replace old Sheet 9 with a new Sheet 9 (submitted herewith and dated September, 1896); this new Sheet 9 includes only such dimensioned details as may be used under any and all cars, and therefore may be adhered to as standards; some of the smaller parts, such as the pipe clamp, the release valve-rod guide, the dead lever guide bracket, the staple, etc., have been entirely omitted; the dimensions of the cross-section of the malleable iron truck lever connection have been increased, it having been proved by experience that malleable iron truck lever connectors made in accordance with the old design are not sufficiently strong.

12. *Automatic Coupler.*—On Sheet 11 eliminate the illustration of carrier iron, as it does not agree with the illustration of carrier iron given on Sheet B as recommended practice. The text now reads: "Carrier iron as shown for this coupler adopted in 1889"; modify this to read: "In 1889 the Association decided that the opening in carrier iron where draw head enters should be 5 $\frac{1}{4}$  in. vertically and 5 $\frac{1}{2}$  in. horizontally." Add dimension 8 $\frac{1}{4}$  in. from back of knuckle to back of horn. The design shows the distance from face of end sill to back of knuckle is 10 $\frac{1}{2}$  in., and that the distance from face of end sill to back of horn is 13 in., but does not specify that the distance from back of horn to back of knuckle is 8 $\frac{1}{4}$  in.; it is considered advisable to show this dimension, owing to the fact that many coupler companies are not adhering to it. (The horn ought also to be shown in the plan view as well as in the elevation.)

16. *Check Gage for Mounting Wheels.*—It is probable that the report of the Committee on Mounting Wheels may embody some suggestions affecting these standards, but the Committee on Standards has none to offer.

18. *Height of Drawbar.*—Add to the text the following: "By center of drawbar is meant the horizontal line through the center of the drawbar shank." It is considered necessary to identify this line owing to the fact that in some couplers the center of the knuckle does not correspond to the center of the shank.

#### RECOMMENDED PRACTICE.

22. *Specifications for Cast-Iron Wheels.*—The Committee on Standards advises the appointment of a special committee to investigate and report at the convention of 1897 (the indications are that wheels are now being made considerably heavier and that practice has changed considerably since these specifications were adopted).

23. *Guarantee for Cast-Iron Wheels.*—This matter to also be considered and reported on by the above suggested committee.

25. *Check Chains.*—The text now reads as follows: "In 1893 the use of truck and car body check chains properly applied was adopted as a recommended practice—see Proceedings, 1874, pages 27 and 72; Proceedings, 1893. Add clause as follows: "In 1896 it was agreed that this recommendation was confined to passenger equipment cars only." This seems to be necessary owing to the fact that it is exceptional practice for freight trucks to be equipped with check chains."

28. *Protection of Trainmen.*—Eliminate the words "Split spring cotter" shown at the head of brake staff, and substitute a note corresponding to Rule 3, clause S-1 of the Interchange Rules: "Brake wheel secured to the shaft with properly fitted nut"; add a note near foot of brake shaft (corresponding to Rule 3, clause S-2, Rules of Interchange) reading as follows: "Bottom of brake shaft secured by a nut or key or some other suitable device to prevent shaft lifting out of position." In illustration of car omit the corner band (poling iron); under the head of "Steps," the text reads: "Two good, substantial steps to be made of wrought iron  $\frac{1}{2} \times 1\frac{1}{2}$  in. in diameter." Alter the dimensions to read: "About  $\frac{3}{8} \times 1\frac{1}{2}$  in. Eliminate the intermediate supports of the ladder sides showing supports only at the top and bottom of these sides; eliminate the ogee finish at the top of ladder sides; eliminate all dimensions applying to ladder except that the rounds should be marked "not less than  $\frac{3}{4}$  in." and that the bolts or lag-screws should be marked "not less than  $\frac{1}{2}$  in."; eliminate the Kirby guard; eliminate all dimensions of grabirons except that those on ends and sides of cars should be marked "not less than 21 in. long"; modify the dimensions showing level of end handholds above bottom of end sill by making it read "about 24 in."; eliminate all dimensions of the running board and the running-board brackets, except that the width of the running board should be shown as "not less than 21 in." and that the end of running board should be "not more than 6 in." back of face of buffer block. The text on page 423 under the head, "Ladder and Hand Holds," now reads as follows: "Each box and stock car should have two iron or wooden ladders with not less than five steps to each ladder; the steps to be not less than  $\frac{3}{4}$  in. in diameter; if of wood not less than  $1\frac{1}{2} \times 2$  in., and to be made of hard wood; the steps to be not less than  $2\frac{1}{2}$  in. from side or end of car." Revised Sheet A (dated September, 1896) submitted herewith.

29. *Buffer Blocks and Location.*—On Sheet A eliminate the detail of buffer block and the design showing their location, as this one-bolt buffer block projecting 6 in. from the end sill is practically obsolete, as it is being superseded by the two-bolt buffer block projecting 8 $\frac{3}{4}$  in. from end sill, as shown by Sheet B.

30. *Platform Safety Chains.*—Eliminate the cuts, make corresponding modification in the text on page 421, and add "platform safety chains for passenger equipment cars to be located 14 $\frac{1}{2}$  in. each side of center; to be suitably attached to under side of platform timbers, and



to be of such length that when extended horizontally the chain with hook shall measure 12 3/4 in. from face of end timber to bearing point of hook, and the chain with eye shall measure 2 3/4 in. from face of end timber to bearing point of eye. The hook shall not be more than 1 1/4 in. thick transversely, and the eye shall not be less than 1 1/2 in. wide, or less than 4 in. long in its openings. When facing end of car the chain fitted with hook shall be on the left-hand side, and the chain fitted with eye on the right-hand side."

31. *Attachment of Couplers to Cars.*—Change the text on page 42, and the cut on Sheet B., so that the capacity of the draft spring will be shown as being 19,000 lbs. instead of 22,000 lbs., as now. It is conceded that draft springs of the dimensions shown by the cut will not average more than 19,000 lbs. ultimate capacity.

32. *Loading Logs, Poles and Bark on Cars.*—The Committee on Standards advises the appointment of a special committee to investigate this subject, and to report at the Convention of 1897.

33. *Safety Chains for Freight Cars.*—Change the cuts to show the standard two-bolt buffer blocks projecting 3/4 in. from end sill; although safety chains are not generally used on freight equipment cars, it is considered advisable to perpetuate this recommended practice in order that it may be followed in those few cases (principally logging cars) where platform safety chains are applied to freight equipment cars.

37. *Dummy Coupling Hook.*—This matter will be affected by the decision of the Association in the matter of the revision of the Interchange Rules, but the Committee on Standards has no recommendation to make.

39. *Air-Brake and Signal Instructions.*—These are not included among either the Standards or Recommended Practices of the Association as given in the Proceedings and in the separate pamphlet entitled "Standards and Recommended Practices," but are embodied in a separate small pamphlet entitled "Air-Brake and Signal Instructions as Approved by the Master Car Builders' Association and the American Master Mechanics' Association, June, 1892." The Committee on Standards is convinced that these air-brake and signal instructions need to be revised and, therefore, advises that the Master Car Builders' Association should appoint a special committee, and should request the Master Mechanics' Association to appoint a similar special committee, with the understanding that these two committees should work as a joint committee to revise these air-brake and signal instructions and should submit the revision to the two associations at the conventions of 1897.

## EXHIBITS.

Adams & Westlake Co., Chicago, Ill.—Samples of the "Acme" car window shade; samples of Pantasote and a large variety of curtain fixtures and materials.

American Balance Slide Valve Co., San Francisco and Jersey Shore, Pa.—Three types of valves, each with snap ring packing to make the joint between the top valve and bearing plate, first, plain slide valve; second, single and double balance; third, Allen port valve. Two of these valves were used at the Master Mechanics' tests at Purdue. Among the roads on which these valves are now used are the Southern Pacific, Illinois Central, Chicago & Northwestern, Pennsylvania, and Michigan Central.

American Steel Casting Co., Thurlow, Pa.—A cast-steel locomotive frame with the following physical characteristics: ultimate tensile strength, 70,000; elongation, 30 per cent.; reduction of area, 49 per cent. This is the first cast-steel frame ever exhibited. They also show open-heart steel cast driving-wheel center.

Automatic Track Sanding Co., Boston, Mass.—Patent pneumatic hand and automatic track sanding apparatus and their methods of operation. The latter is shown as operating automatically with the Westinghouse engineer's valve whereby sand may be thrown on the track in an ordinary service stop, when starting, or upon an emergency application.

W. C. Baker, 143 Liberty street, New York City.—The Mighty Midget and the Little Giant and double coil fire-proof car heaters and special fittings for Baker heater work. Boston Belting Co., Boston, Mass.—The company has on exhibition a complete line of rubber belting; air-brake, car heating, gas steam and water hose; "Phoenix" flange and joint packing; "Imperial" plain and spiral and other piston-rod packing; "Excelsior" self-vulcanizing packing; rubber locomotive blocks; diaphragms for Eames vacuum brake; mixed, fibrous and plumbago gaskets and rings; rubber mallets and mats and car and cylinder springs; car step treads; brake, gas and steam tubing; solid rubber ball valves; rubber washers and various kinds of rubber mechanical goods.

Boston Woven Hose and Rubber Co., Boston, Mass.—Specimen of steam and air-brake hose.

Buckeye Malleable Iron & Coupler Co.—Two Little Giant car couplers mounted on trucks to show method of operation and equipped with the Universal unlocking lever designed for any make of couplers. The lever is so constructed that the coupler is readily uncoupled when the car is loaded with timber or railroad rails projecting over each end of the car.

Bundy Manufacturing Co., Binghamton, N. Y.—Bundy time recorder, a mechanical device for determining time of arrival and departure of employees.

F. A. Barbey & Co., Boston, Mass.—Specimens of the "Imperial" portable air-brake clamp. The company has two exhibits of this device, one on the upper veranda and another shown with the exhibit of the Hampden Flexible Steam Joint Co., F. A. Barbey & Co. being general selling agents for that company.

The E. T. Burrows Co., Portland, Me.—Specimens of pinch handle and cable design car window shades; waterproof curtain fabric "Oakette," and a general line of curtain fixtures and materials.

Bridgeport Car Equipment Co., Bridgeport, Conn.—Model of car equipped with the third rail system, connection being made with third rail by means of rollers. The third rail is of minimum height and placed midway between the tracks.

Carnegie Steel Co., Ltd., Pittsburgh, Pa.—The exhibit of this company consists of two steel hopper cars of 100,000 lbs. capacity each (one loaded with 80,000 lbs. of iron ore, the other empty), and two steel flat cars of 80,000 lbs. capacity each (one loaded with steel rails). These cars were fully illustrated and described in our issue of June 12, 1896, page 408. The cars may be seen on the tracks of the Delaware & Hudson Canal Co.

Chicago Grain Door Co., Chicago, Ill.—Model of rabbeted grain door and samples of the "Security" lock bracket for outside doors.

Chicago Pneumatic Tool Co., Chicago, Ill.—Exhibit pneumatic hammers in eight styles, piston air drills; pneumatic sand-papiering machine; pneumatic rivet holder; pneumatic belt shifter; pneumatic flue expander; pneumatic counter-balance and hoist and pneumatic cleaner for seats; upholstery, etc. All the tools were in operation under air and the exhibit is among the most interesting at the Convention.

Chicago Railway Equipment Co., Chicago, Ill.—The "National" hollow brake beam, of which over 800,000 are now in use.

J. R. Clancy, Syracuse, N. Y.—Samples of Redfield's sure-grip hose clamp.

Consolidated Car Heating Co., Albany, N. Y.—Rack equipped with lamps showing the Pope system of lighting cars.

Henry Dietz, representing the One Piece Draw Bar Co., Chicago, Ill.—Exhibits passenger, freight and locomotive couplers, also the Ogden train jack.

Evans Artificial Leather Co., Boston, Mass.—Several large samples of "Morocoline," a substitute for leather; also two car seats upholstered with this material.

A. T. Farquhar Co., York, Pa.—Exhibit of a locomotive boiler.

French Renovating Co., Cleveland, O.—Samples of plush renovated by a liquid manufactured by this company for cleaning and dyeing plush in all colors.

A. French Spring Co., Pittsburgh, Pa.—A number of elliptical car and engine springs.

Foster Engineering Co., Newark, N. J.—New automatic safety stop valve in practical operation, air-brake pump governor applied to the air pump attached to the large steam boiler, and a 2 1/2-in. reducing valve and pump governor applied to an air-compressor exhibited by the Ingersoll-Sargeant Drill Co. A line of safety boiler checks and reducing valves for steam heating of trains is also shown.

The Gilchrist Co., Chicago, Ill.—Full size Gifford M. C. B. car coupler.

Gisholt Machine Co., Madison, Wis.—Universal tool grinding machine, which is made for grinding special tools, as the tool holder can be set directly to the exact angle of

clearance required without calculating angles. The machine is especially valuable in grinding thread tools.

M. J. Grady, Kingston, Canada.—The G. & M. couplers for freight and passenger cars. These couplers have never been exhibited before and are covered by patents of April 15, 1895, and June 5, 1896. The power is applied by a direct-acting lever.

Hampson Flexible Steam Joint Co., Lakeport, N. H.—Flexible steam joint for passenger cars and steam drills. A number of the joints are shown in actual operation.

C. Haessler Co., Philadelphia, Pa.—Full line of pneumatic portable power tools consisting of the Phoenix drilling, reaming, milling and drilling machine; pneumatic emery wheel motor; Keller pneumatic chipping and calking tools; pneumatic breast drill and a sand sifter.

Hancock Inspirator Co., Boston, Mass.—Several full size and sectional Hancock inspirators and ejectors; steam valves; check valves and patent strainers.

Ingersoll Sargeant Drill Co., 26 Cortlandt street, New York City.—Triple two-stage piston inlet air compressor. Air cylinders are on either side of bed plates. The high pressure air cylinder is located between the two steam cylinders and the low-pressure piston-inlet cylinder is directly behind and in line with two stage cylinders. Above the air cylinders an intercooler is placed. They also exhibit an 8 in. x 8 in. belt actuated compressor provided with vertical lift-inlet valves, water circulating space in cylinder heads and automatic regulator.

Interchangeable Brake-Beam Co., St. Louis, Mo.—Several brake-beams showing reversible strut.

Klinger Coupler Co., Beaver Springs, Canada.—Full size patent car coupler, M. C. B. type.

The M. E. Kanaly Co., Cambridgeport, Mass.—Car door showing the Kanaly car-door hanger.

Knitted Mattress Co., Canton Junction, Mass.—Sample mattresses filled with knitted elastic packing and several samples of the knitted elastic packing for filling cab and caboose cushions, sleeping-car mattresses and car seats, and for upholstering car seats and backs.

Henry L. Leach, North Cambridge, Mass.—Full size locomotive track sanding apparatus showing method of operating.

Lewis Tool Co., 44 Barclay Street, N. Y. City.—Patent combination pipe, adjustable jaw and solid jaw vises.

Morris Box Lid Co.—sample of journal box lids.

Wilson & McIlwain, Pittsburgh, Pa.—Improved handle for quarterway cocks.

A. Major, 461 Pearl street, New York City.—Samples of Major's combined ice water cooler and filter, overflow pipe, ice receptacle and cement.

Manning, Maxwell & Moore, Liberty street, New York City.—Ashcroft Mfg. Co.'s improved locomotive gage, Tabor steam engine indicator, Hayden & Derby Mfg. Co.'s improved double tube sectional locomotive injector, Consolidated Safety Valve Co.'s improved locomotive muffler pop valve and incased locomotive pop valve and a photograph of the largest lathe ever produced in this country for the Watervliet Arsenal for turning and boring 16-in. bore guns for U. S. Government.

Massachusetts Mohair Plush Co., Boston, Mass.—This company displays as an exhibit a diploma and medal received for a fine car and furniture plush at the World's Fair in 1893.

More, Jones & Co., St. Louis.—Specimens of car and locomotive brasses.

Moran Flexible Steam Joint Co., Louisville, Ky.—A large number of flexible ball and socket joints for steam pipe connections, especially adapted to steam-heating connections between engine and tender. Joints are applied to a steam-pipe for exhibition in which the actual operation of the joint is illustrated.

National Machinery Co., Tiffin, O.—Blue prints of the complete line of bolt cutting and heading and nut tapping machinery, bulldozers and automatic and hand-fed spike machinery which this company manufactures extensively, and samples of spikes with rolled points made by a special automatic machine with a capacity of 75 spikes a minute, the whole spike being made in one operation. This machine is the only one of its kind ever built. The company also exhibits the diploma and medal received for the full line of machinery exhibited at the World's Fair in 1893.

National Car Wheel Co., Buffalo, N. Y.—Spoke center, double-plate center (with internal ribs), and cast-steel center, boltless car wheels, with Gibson fastening and spoke center and double-plate center wheels with Mansell fastening.

National Coupler Co., Chicago, Ill.—National M. C. B. and Miller combination passenger coupler and freight coupler.

National Malleable Castings Co., Cleveland O.—A number of malleable iron castings, including bottom center plates as used by the Wheeling & Lake Erie Railroad, stake pockets, pockets for car sills, plates, carlines and brake blocks, journal box lids and the National car door fastener applied to a model of a freight car door, M. C. B. standard journal boxes, running boards, saddles, center plates, hand brake wheels and five full-sized Tower couplers of different styles, the construction being shown by sectional castings.

New York Belting and Packing Co., 25 Park place, New York City.—Complete line of air-brake and steam hose; rubber tiling, bicycle tires, etc.

New York Car Coupler Co., 126 Liberty street, New York City.—Two full size M. C. B. couplers mounted on trucks.

New York Rubber Co., 84 Reade street, New York City.—Steam, water and air-brake hose, sheet and piston packing, gaskets, corrugated steam hose, diaphragms for Eames vacuum brake and vacuum brake hose.

A. J. Norton, Boston, Mass.—Norton ball-bearing railroad and bridge jacks, from 15 to 70 tons capacity, for all classes of work; wrecking car jacks on traversing bases; ratchet journal jack, weight 20 lbs., capacity 8 tons, and the Norton "Sure-Drop" track jack.

Pedrick & Ayer Co., Philadelphia, Pa.—Horizontal and vertical pneumatic hoists, automatic compressor and a belt-driven air compressor.

Peerless Rubber Co., 16 Warren street, New York City.—An extensive exhibit of the "Anaconda" corrugated engine and tender hose; air-brake, steam, gas and fire hose; a roll of the famous "Rainbow" sheet packing; "elliptical" sectional gaskets; spiral piston packing for Westinghouse air-pumps, and all styles of moulded gaskets used by the Westinghouse Air-Brake Co., rubber step-treads, gage glass rings, pump valves; hard rubber valve discs and rubber belting and matting.

Q & C Co., Chicago, Ill.—Model and full size McKee brake slack adjuster, showing the absolute action of this device; Williams' valve setting machine and the Q & C flush freight car door.

Railroad Supply Co., Chicago, Ill.—Two full-size Hien double automatic M. C. B. car couplers, and jack for raising car to remove and place brasses in journal box.

Reliance Replacer Co., Jersey Shore, Pa.—Cast-steel car and locomotive replacer, weighing 86 lbs.

Revere Rubber Co., Boston, Mass.—U-shaped car heating hose; locomotive tender and air-brake hose; pyramid of the celebrated "Giant Red" valves; car step treads, gaskets, rubber tread, "Usdinian" and "Giant Red" sheet packing; four solid rubber valve balls, and a biscuit of Para crude rubber. The whole exhibit was laid on an interlocking rubber mat, 12 x 4 ft., with "Master Car Builders' and Master Mechanics' Convention, 1896," inscribed in colored rubber, representing an artistic and skillful piece of work.

Rose Valve Co., Troy, N. Y.—Complete line of reducing valves for steam, water and air, and patent reducing and regulating valves for steam.

Sams Automatic Car Coupler Co., Denver, Col.—Model of two freight cars with the Sams automatic link and pin coupler attached.

Safety Car Heating and Lighting Co., 160 Broadway, New York City.—Display of the 1 inch system of car lighting, on exhibition in parlor of Congress Hall.

Schoen Pressed Steel Co., Pittsburg, Pa.—Exhibit pressed steel truck frame and swivel diamond pressed steel bolsters.

Shickel, Harrison & Howard Iron Co., St. Louis, Mo.—Two car trucks showing different designs of cast-steel truck and body bolsters.

J. H. Sewall, Worcester, Mass.—Two full-size standard brake slack adjusters.

Springfield Malleable Iron Co., Springfield, O.—Four full-size Ludlow M. C. B. car couplers.

Star Brass Mfg. Co., Boston, Mass.—Locomotives pop-safety valves, steam gages, whistles, rod cups, water gages, gage cocks, cylinder relief valves and cab lamps.

Edward Smith & Co., 45 Broadway, New York City.—Samples of the Baker system of preservation applied to locomotive cylinders and specimens of metals. The old pot in which varnish was first made is also shown.

Taylor Iron & Steel Co., High Bridge, N. J.—Taylor's interlocking rib section, steel-tire welded car wheel, and full size and section of spoke car wheel with Taylor steel tire.

B. E. Tilden Co., Chicago, Ill.—Samples of car and locomotive replacing frogs.

Universal Construction Co., Chicago, Ill.—This company has on exhibition on the tracks of the Delaware & Hudson Canal Co. two steel flat and one steel hopper car. The flat cars were shown in the Railroad Gazette of June 12, 1896, page 410, in connection with the article on "Progress in Steel Car Frames." The hopper is of steel, with a capacity of 80,000 lbs., and weighing 26,480 lbs. It was built for the Chicago, Lake Shore & Eastern Railway and is equipped with Tower couplers, Westinghouse air-brake and Haskell and Barker wheels.

Vose & Cliff Mfg. Co., 39 Cortland street, New York City—King's yielding side bearings.

Western Railway Equipment Co., St. Louis, Mo.—Model of the Houston locomotive track sander illustrating mode of operating; a combination lug and follower for draft rigging and the Economy slack adjuster.

Westinghouse Machine Co., Pittsburgh, Pa.—The company installed for exhibition one of its 75 H. P. engines which furnishes power for running several stationary belt driven exhibits.

William Yerdon, Fort Plain, N. Y.—Improved double hose bands.

The Zenner-Raymond Disinfectant Co., Detroit, Mich.—The "Zenoleum" disinfectant machine and liquid for flushing, and the absolutely odorless "Raymond," a high-grade disinfectant for private, parlor and sleeping cars, the right to manufacture which has recently been purchased. This liquid has been adopted by the French Government for its railroads, army and navy.

The exhibits occupy the entire two inner verandas and the Court of Congress Hall. It is the largest exhibit ever made at any convention. The particular feature of the exhibit is the application of compressed air for special tools and machines.

The boiler furnishing the power to run the various exhibits was loaned through the courtesy of the Delaware & Hudson Canal Co., and was equipped with the following specialties: Foster regulator, Westinghouse pump, Hancock inspirator, Foster air-brake pump governor, Monitor injector, Jenkins connecting valve, and covered by asbestos from the H. W. Johns Manufacturing Co.

## Foreign Railroad Note.

There was a limited train last year between London and Switzerland, and it is to run this year, beginning July 4. The passenger leaves London at 11 in the morning, arrives at Basel, in the northwest corner of Switzerland, at 5 the next morning, at Zurich at 7:06, and at Coire, in the very heart of the country, at 9:48. This year there will be sleeping-cars also for Interlaken and Lucerne.

## Production of Metallic Bars by Extrusion.

The principle of extrusion has been applied for some time in the production of continuous lengths of leaden pipes and rods at comparatively low temperatures, but the process of extrusion at high temperatures is practically a new industry. The invention of Mr. Alexander Dick was thoroughly discussed in a paper read at the Spring Meeting of the Iron and Steel Institute (British) by Mr. Perry F. Nursey, and the process of manufacture is best described in his own words:

"The heated metal is placed in a cylindrical chamber, at one end of which is a die. Upon pressure being applied at the opposite end, the plastic metal is forced through the die, issuing therefrom as rods or bars of the required section, and of a length governed by the quantity of metal placed in the receiver. This pressure chamber has not only to withstand the high temperature of the contained metal, but has likewise, while under the influence of that temperature, to meet the severe strain brought upon the interior by the resistance of the metal to the pressure of the hydraulic ram in forcing it out through the contracted area of the die."

As a result of a series of costly experiments in order to find the best form of the cylinder and the material of which it should be constructed, Mr. Dick succeeded in producing one in which the container or pressure-chamber was divided up into sections composed of concentric steel tubes alternating with annular spaces packed with a dense non-conducting material. This arrangement is based upon the principle that heavy steel castings, when heated to a high temperature, lose their initial strength. Although the liner is exposed to the extreme heat of the metal, it is made with a thin wall and is not liable to be fractured by unequal heating and cooling. He also found that the best results were obtained by using crushed granite mixed with borax as the non-conducting material. This system as now in use at the Delta Metal Works in London has turned out in four minutes, four 1-in. rods, each measuring over 12 ft. in length. The working of this system of production is described by Mr. Nursey as follows:

"A charge having been put through, the opening at the front of the container was closed by a removable plate and the container turned in a vertical position. A charge of 150 lbs. of molten metal was then poured into the container and was allowed to stand about six minutes so as to acquire the plastic condition. The diameter of the plunger and that of a loose block which is placed between it and the charge, and heated previously to placing it in position, being less than the diameter of the steel liner, the plastic metal when under pressure would be forced backward between the block and the liner, were it not prevented by a steel check-disk which is less plastic and more rigid than the heated metal at the working temperature. The loose block having been inserted, the container was brought into a horizontal position, the stop-plate removed and the container was run up to the die-block. The hydraulic pumps were then started and in four minutes the charge was expelled, after which the chips were released and the ram continued its forward travel, pushing out the remaining metal, together with the die and its holder as well as the check disk and the loose block, thus leaving the container perfectly clear for a fresh charge. The die and the holder were then replaced by others, the container turned over in a vertical position, the stopper fixed in place, a fresh charge of metal poured in and the operation of pressing was again proceeded with."



Owing to the great pressure put upon the metal its quality must necessarily be improved in the same way that Whitworth steel is improved by compression; also the tensile strength is increased more than 20 per cent. in ordinary yellow metal over that of hot rolled bars of the same substance.

#### The Hien Double Automatic Coupler.

This coupler is of the M. C. B. type, having the standard contour of the M. C. B. Association, but the locking device and release rig are designed on an entirely different principle from any now in the market, and consist of a revolving lock which is alternately revolved by the lifting pin and the tail of the knuckle. The unlocking device is such that all devices for holding the release lever on the car end are dispensed with, and the bending of the release lever or stretching of the connecting chain between the lock and lever will not affect the un-

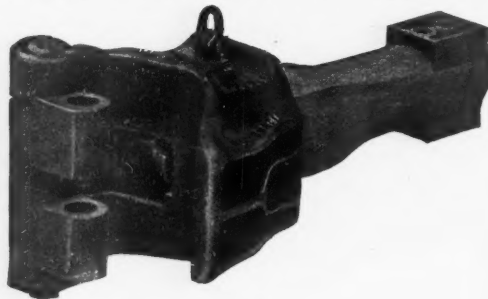


Fig. 1.

coupling device. With the present M. C. B. couplers two operations by the yardmen are necessary to uncouple a car and then couple it again.

With the Hien double automatic coupler one operation accomplishes this by merely raising the lever and letting go. It then falls into its normal position, and consequently the yardman is not required to leave the switch in drilling cars. All he has to do is to make the "cut."

The whole drawhead is larger and stronger than any coupler now on the market. The ears of the coupler carrying the knuckle have also been increased proportionally, thus giving the additional strength necessary to avoid present breakages. The lock has broad wearing surfaces and is compact, simple and strong. The knuckle has been increased in depth between 15 and 20 per cent.

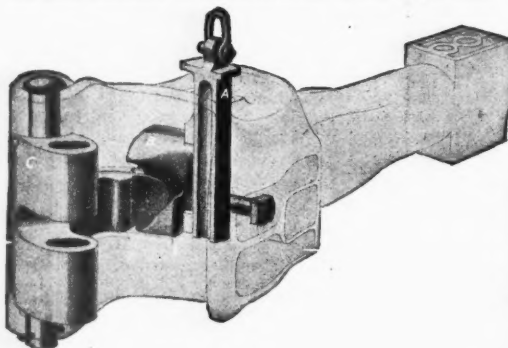


Fig. 2.

in depth over the usual form of M. C. B. knuckles, and also in thickness where possible, and the wearing surfaces between the tail end of the knuckle and lock are larger than in any other coupler now in existence, thus diminishing the wear between the tail of the knuckle and the lock.

Ordinarily the guard arm is the weak point in an M. C. B. coupler. In the Hien coupler the guard arm is supported immediately in the rear by the draft timbers, and forms a buffer which takes the blow in a straight line to the draft timbers.

One of the serious objections to the M. C. B. coupler is that in case of breakage in the neck, or the draft tim-

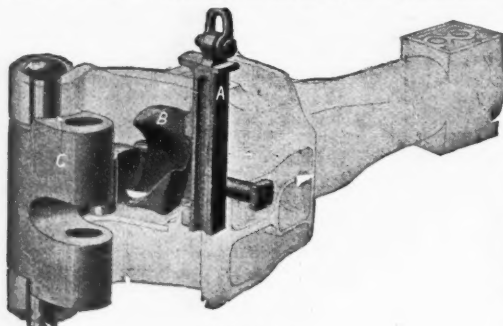


Fig. 3.

bers pulling out, the coupler will fall on the track and cause wrecks.

In the Hien coupler this class of accidents is provided against by an independent chain which is attached at one end to the car and at the other end to a short lever on the side of the coupler so that in case the head breaks at the shank it will be carried by this chain, or if the draft rigging gives out this chain will immediately re-

lease the lock. It is also possible to uncouple with this small lever, or in case the coupler has been set to uncouple, and it is desirable to couple again, to throw the lock into the coupled position.

These couplers can be made of either malleable iron or

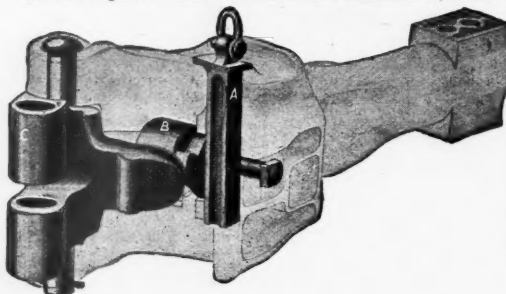


Fig. 4.

steel. At present the draw-bar lifting pin and lock are made of malleable iron; the knuckle and pivot pins of steel.

Fig. 1 shows the coupler locked. Figs. 2, 3, and 4 show the various positions of the lifting pin A, locking block B, and knuckle C as placed by the operation of the coupler under the instructions "to uncouple raise lever and let go." The act of uncoupling the lock sets it automatically to couple again.

Fig. 2 shows the position of lock B after the lever is raised and let go. Here the locking block B is revolved



Fig. 5.

by the lifting pin A to such position that the tail of the knuckle C is ready to sweep open.

Fig. 3 shows the act of uncoupling. Here the tail of the knuckle is half open and revolving the locking block B back to its original position.

Fig. 4 shows "the locking block setting itself automatically to couple again," the tail of the knuckle C being completely open and with the locking block B in position to couple again. As the tail of the knuckle is swept back to the position as shown in Fig. 1, the locking block B rises and allows it to pass, then drops by gravity and locks the tail of the knuckle as shown in Fig. 1.

Fig. 5 shows the knuckle side of the coupler in per-

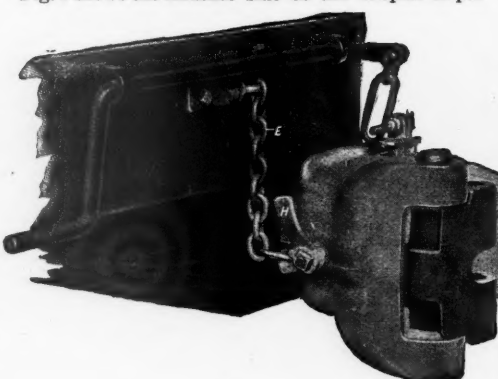


Fig. 6.

spective, where the short projection D on the side is attached to the safety chain E and the safety chain to the end of the car. H is a small handle for operating the lock if desirable. This view shows the coupler in its normal position and locked.

Fig. 6 shows the same view as Fig. 5, except that the lock B and handle H have been revolved by raising the lever and letting go, placing the lock as in Fig. 2. This is the position taken by the lock when the coupler either breaks or pulls out and the safety chain E acts.

Fig. 7 is a view of the knuckle showing the extra strength of lugs on knuckle.

Fig. 8 is a view of the lock bolt and handle attached thereto.

Fig. 9 is a view of the lifting pin which revolves the lock.

#### The Russian-American Locomotive Works.

The plans for the establishment of locomotive works in Russia by an American company have now assumed a very definite shape. Mr. W. F. Dixon, formerly chief

draftsman of the Rogers Locomotive Works, who is to have charge of the plant when completed, after spending about a year in Russia, is now in this country to make contracts for tools and machinery. Contracts for machinery amounting to about \$500,000 have already been given out, most of the contracts so far let having gone to Philadelphia firms. These orders are to be ready for shipment by next September.

The project for the establishment of a locomotive plant in Russia by an American company has been talked of for several years. Mr. E. M. Herr, of Chicago, made a special trip to Russia a few years ago to investigate the conditions under which such a plant could be operated on behalf of the company, in which, we believe, the Baldwin Locomotive Works was to have a considerable interest. The company now having the matter in charge is called the Russian-American Manufacturing

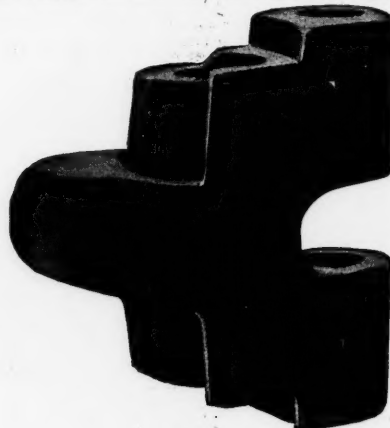


Fig. 7.

Co., in which New York and Philadelphia bankers have the chief financial interest. Edmund D. Smith & Co., bankers, of Philadelphia, are very largely interested in the project. The President is Mr. H. H. Hollister, of 21 Broad street, New York City. According to the present plans the plant will have an output of 200 locomotives a year. The chief officers of the company, the foreman

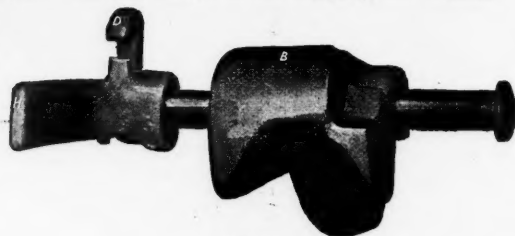


Fig. 8.

and others of the working force, will be Americans, Mr. Dixon, as stated above, being in direct charge of the plant.

The plant is to be built in connection with the Sormova Works, an extensive establishment in Nijni Novgorod, southeast of Moscow, manufacturing cars, steamboats, steam boilers, etc., and employing 5,000 hands.

Among the Philadelphia firms which have received large contracts for machinery are Bement, Miles & Co., William Sellers & Co., E. Harrington Sons & Co., Newtown Machine Tool Works, Pencoyd Iron Works, Pedrick & Ayer Machine Co., and Wilbraham Bros., of Philadelphia; Hilles & Jones and the Betts Machine Co., of Wilmington, Del., also secured orders. In all, about 30 firms have received contracts. The machinery will aggregate 2,000 tons and will be shipped directly from Philadelphia to St. Petersburg.

The order of the Newton Machine Tool Works includes heavy milling machines, cold saw cutting-off machines, boring machines, etc. The order of the Betts Machine Co. includes 15 planing machines, running from 36 in. square to 48 in. square, various lengths, and the larger sizes with four heads; two on the cross-rail and one on each upright; six slotting machines, from 12 in. to 15 in. in size; one horizontal boring and drilling machine, and one heavy 50-in. upright drilling machine.



Fig. 9.

#### Supreme Court on the Separate Car Law.

The question of the constitutionality of the law of Louisiana requiring separate cars for colored passengers, which was before the Supreme Court of the United States and the decision of which was reported in the *Railroad Gazette* of May 22, was also the subject of a vigorous dissenting opinion by Judge Harlan. It will be



remembered that in this case—which, like several others, was a suit of a person, having some African blood, for damages for being ejected from a car set apart for white persons—the road was wholly intra-state, its line beginning and ending in Louisiana, and it does practically no inter-state business whatever. The opinion of the Court, which was agreed to by the whole Bench except Judge Harlan and Judge Brewer, the latter of whom did not hear the pleadings, is based on the argument that, equal privileges being guaranteed, the law cannot be regarded as imposing any badge of slavery, or servitude, or humiliation. Many years ago in Massachusetts a case against the School Committee of Boston, which had established separate schools for colored children, was argued by Charles Sumner, but Chief Justice Shaw, delivering the opinion of the court, said: "But when this great principle of equality before the law comes to be applied to the actual and various conditions of persons in society, it will not warrant the assertion that men and women are legally clothed with the same civil and political powers, and that children and adults are legally to have the same functions and be subject to the same treatment; but only that the rights of all, as they are settled and regulated by law, are equally entitled to the paternal consideration and protection of the law for their maintenance and security."

In a Mississippi case (133 U. S., 587), a railroad company was indicted for not complying with the statute requiring separate accommodations; and, the statute applying solely to commerce within the state, the Supreme Court of the United States sustained it. The Louisiana law is therefore sustained; but the court is not prepared to say that the conductor does not run some risk in assigning passengers to particular cars, as the law requires, for it imposes upon him the duty of determining to what race a passenger belongs. In this case the plaintiff, Plessy, claimed that he was so white that he had a right to the reputation of belonging to the dominant race, and that this right was property; but if he actually be a white man he has his remedy in an action for damages against the road, while if he be a colored man, he has no lawful right to the reputation of being a white man. It has been suggested that the argument justifying this law would also justify a requirement that separate cars be provided for people whose hair is of a certain color, or requiring colored people to walk upon one side of the street and white people upon the other. The reply to this is that every police regulation must be reasonable; and be made in good faith or for the promotion of the public good. So, then, this case reduces itself to the question of reasonableness and the court holds that "the legislature is at liberty to act with reference to the established usages, customs and traditions of the people, and with a view to the promotion of their comfort and the preservation of the public peace and good order. Gaged by this standard, we cannot say that a law which authorizes or even requires the separation of the two races in public conveyances is unreasonable, or more obnoxious to the Fourteenth Amendment than the acts of Congress requiring separate schools for colored children in the District of Columbia, the constitutionality of which does not seem to have been questioned, or the corresponding acts of state legislatures."

The plaintiff's argument implies that if the colored race should become dominant in the legislature and should enact a law precisely like the present one, it would thereby relegate the white race to an inferior position. This is not a sound proposition. . . . If the two races are to meet upon terms of social equality it must be the result of natural affinity, a mutual appreciation of each other's merits and a voluntary consent of individuals.

The question how white a person must be to be taken out of the category of "colored" persons, is to be determined under the laws of each state and is not at issue in this case.

Justice Harlan, dissenting, begins by calling attention to the clause of the law allowing colored nurses to attend white children in the car for white people, while a white man may not have his colored servant with him, even if he be sick and require his attendance. The constitution "does not permit any public authority to know the race of those entitled to be protected in the enjoyment of constitutional rights." This argument is carried out to considerable length, with glorification of the legislation enacted since the war to establish the rights of colored persons. Everyone knows that the purpose of the Louisiana statute was, not to exclude white persons from the company of blacks, but to exclude colored persons from the cars assigned to whites. It is one thing for a railroad to furnish equal accommodations and quite another for the Government to forbid one citizen from traveling in the same conveyance with another and to punish a railroad officer for permitting persons of the two races to ride in the same car. Why may it not punish whites and blacks for riding together in a carriage on a public road?

The majority of the court says that police regulations are lawful provided they are not unreasonable; but where do we find the authority for referring the question of reasonableness to the judgment of the courts? The courts have nothing to do with the policy or expediency of legislation. The white race is, indeed, dominant in this country, but the constitution is color-blind, and neither knows nor tolerates classes among citizens. It is therefore "to be regretted that this high tribunal has reached the conclusion it has; the judgment this day rendered will in time prove to be quite as pernicious

as the decision in the Dred Scott case." It will stimulate aggression by the alleged superior class of citizens in some states and will encourage the belief that a state may defeat the beneficent purposes of the recent amendments of the constitution. We may reasonably expect that some day a law will be passed to separate black jurors from white by a partition, and that the partition shall be taken into the consultation room; where, perhaps, it may have openings through which white and black jurors may confer as to their verdict without coming into personal contact with each other.

#### Latest Notes on Exhibits at the Master Car Builders' Convention.

The notes that we give below complete the list of exhibitors as far as could be obtained at the time of going to press.

The Ball-Bearing Co., Boston, Mass.—Samples of the "Hub" anti-friction ball-bearings for general machine construction, Bellamy Co., 243 Pearl street, New York.—Samples of wood and veneers coated with the Bellamy feller.

J. G. Brill Co., Philadelphia, Pa.—Model of passenger-car truck "No. 27."

Brussels Tapestry Co., Chauncey, N. Y.—Car curtain materials and the "Perfect" self-adjustable curtain fixture. Crown Car Coupler Co., Troy, N. Y.—Two car couplers, M. C. B. type, mounted on trucks ready for service.

Eureka Nut Lock Co., Pittsburgh, Pa.—Samples of the Eureka nut lock for use on draft rigging, arch bars, columns and jaw-bolts and in general car construction. Gould Coupler Co., 66 Broadway, New York City.—The Gould automatic passenger car coupler and combined freight car coupler and spring buffer blocks.

The E. S. Greeley & Co., 5 Dey street, New York.—Two bags of Acme journal packing waste.

Jenkins Brothers, 71 John street, New York.—New and improved disc guaranteed to stand 250 lbs. pressure; full line of gate, globe and check valves; the "Jenkins 86" joint packing and the Sellers' restarting injector of the Sellers Co., Philadelphia.

W. C. Hammett, Troy, N. Y.—Coy's force feed oiler in working order, showing journal, eccentrics and links oiled from cab of locomotive while running at full speed.

Keystone Varnish Co., Long Island City, N. Y.—Samples of the "Red, White and Blue" brand of steel wool made by Aquila, Rich & Co., 70 Maiden lane, New York.

The Kinzer & Jones Mfg. Co., Pittsburg, Pa.—Models and samples of the Kinzer brake-shoes and brake-shoe connections.

J. C. Pearson Co., Boston, Mass.—Samples of cement-coated nails.

Plush Renovating Co., Baltimore, Md.—Exhibit of "Arcanum," especially adapted for cleaning mohair plush and similar fabrics in passenger cars.

Smart Car Door Co., Nashua, N. H.—The Smart burglar, spark and storm-proof flush car door.

Smillie Coupler & Mfg. Co., Newark, N. J.—Full size Smillie improved M. C. B. car coupler.

Standard Steel Works, Philadelphia.—Steel tired wheels with cast-iron centers; section of blank for wrought-iron spoke center as assembled ready for forging; section through forged wrought-iron spoke center; section of ingots used by the Standard Steel Works, and etched sections through perfect tires made from long and short ingots.

Stanley G. Flagg & Co., Philadelphia.—Samples of the Keystone soft metal union.

Trojan Car Coupler Co., Troy, N. Y.—The Trojan safety car coupler of the M. C. B. type. The knuckle may be thrown open for coupling by the hand rod at the side of the car.

#### TECHNICAL.

##### Manufacturing and Business.

The receivers of the Otis Steel Co., Alvin Carl and B. J. Bendow, turned over the property of the company to the reorganized company on June 1 last. The receivers were appointed on March 9, 1895. Mr. Bendow, who has been the active receiver of the company, is General Manager of the reorganized company.

The Q & C Company, of Chicago, has received the gold medal awarded to the company for its exhibit of metal-sawing machinery and tie plates at the Atlanta exhibition.

The Zenner-Raymond Disinfectant Company has been organized to succeed the old A. H. Zenner Company and will continue the manufacture of the Zenoleum disinfectant as well as the Raymond disinfectant. The office is at 87 Shelby street, Detroit, Mich. Mr. F. F. Palms is President and A. H. Zenner General Manager of the new company.

##### New Stations and Shops.

The Atlantic Coast Line has recently purchased about 50 acres of land adjoining the company's shops at Florence, S. C. It is said that additional shops will be erected upon the land bought by the company, and that a large distributing yard will also be located there.

The plans for the new machine shop and boiler shop for the Seaboard Air Line at Portsmouth, Va., have been completed, and the work will begin immediately. The new building will be 80 ft. x 312 ft., fitted with modern machinery for locomotive repairs.

The Pennsylvania is preparing plans for a new passenger station at Frankford, near Philadelphia. It will be built of fancy brick, with stone trimmings, and have steam heating, electric lighting, etc. Bids are to be invited in two or three weeks.

The Berlin Iron Bridge Co. has a contract for furnishing steel trusses for a new building, 50 ft. x 60 ft., for the Holyoke Gas Company at Holyoke, Mass. The roof trusses are entirely of steel, and the covering is slate. No woodwork or inflammable material will be used anywhere in the construction.

General Manager Greene, of the Baltimore & Ohio, made a trip over the line in West Virginia last week, and stated that new stations would be built at Wheeling and Fairmont, and a new office building at Benwood Junction.

The Philadelphia & Reading has awarded to Richard Kearns, of Bridgeport, Pa., the contract for the erection of a brick roundhouse in that borough, to cost about \$7,000. A machine shop, 80x150 ft., will be built on the same site.

Grant Wilkins, of Atlanta, Ga., has secured the contract for the construction of the Seaboard Air Line's new station at Atlanta. The structure is to be 652 ft. x 142 ft., and the office part 56 ft. x 142 ft. It is to be completed by Oct. 15.

The new passenger station of the Seaboard Air Line at Charlotte, N. C., was completed last week. The Southern also has a new station at Charlotte, the efforts which were made early in the year to build a union depot having been successful, both railroad companies approving the plan favored by the town.

The new station to be erected by the Cleveland, Cincinnati, Chicago & St. Louis at East St. Louis will cost about \$40,000 and the roundhouse will cost an additional \$15,000. They are to replace the structures demolished in the recent storm at St. Louis, but will not be rebuilt on exactly the same site. It is stated that the total cost of the improvements will be about \$65,000.

It seems to be definitely decided that the shops of the Seaboard Air Line at Raleigh, N. C., which were burned a short time ago, will not be rebuilt at that city. It is asserted on apparently good authority, that the officers have decided to rebuild the shops at Hamlet, S. C., the junction point of the Carolina Central and Raleigh & Augusta divisions of the Seaboard.

##### Iron and Steel.

The Carnegie Steel Co., has purchased land above its Homestead mills for the early establishment of a \$1,000,000 forging and finishing addition to its plant. Heavy propeller and steamship shafts and gun forgings will be turned out at this new plant. It will comprise open hearth and forge press buildings and annexes for machinery to operate the plant. The plans for the basic furnaces have already been completed and the contracts are about ready to be let. It will require about two years to complete the plant.

Furnace D of the Edgar Thomson blast furnace at Braddock, Pa., was blown out last week and will be dismantled. The furnace will be torn down and rebuilt at an expense of about \$250,000.

##### Axle Lighting.

The National Electric Car Lighting Co. is making some progress in pushing forward the Moscovitz system of car lighting by electricity, taking power from the axle. A car equipped with this apparatus has been running in regular service on the Pennsylvania Railroad between New York and Philadelphia for some weeks, and has now made 4,500 miles. The company has sent in bids for fitting four cars for the Erie to run between Cleveland and Pittsburgh. This is at the request of the company. The company will also fit a chair car for the Atchison, Topeka & Santa Fe to run between Chicago and Kansas City.

##### Car Coupler Litigation.

We have received the following from the Trojan Car Coupler Company:

"Referring to the notice published last week by the Gould Coupler Co. to the effect that they proposed to proceed with the suit against the Trojan Car Coupler Co. as if no preliminary injunction had been asked for by them, the Trojan Car Coupler Co. have only to request that those interested will apply to either the Eastern or the Western Railroad Association, as to the finality of the recent decision by the Court of Appeals, in their favor."

##### Lake Street Elevated, Chicago, Worked by Electricity.

The first train to be run by electricity on the Lake Street Elevated arrived in the down-town district at 12:38 o'clock Sunday morning, June 14. Thirty motors were in service the first day, each having previously made five trial trips between Sacramento avenue and Fifty-second street, between which points the third rail has been charged for some weeks. The cost of equipping the line with electricity is said to be \$300,000. The electric equipment for this road was described in the *Railroad Gazette* May 15, page 333. Everything worked smoothly and no trouble was experienced from the change in motive power.

##### The C A C Tie Plate.

The C A C tie plate is doubtless well known to the readers of the *Railroad Gazette* through descriptions and advertisements, as well as actual use. We are informed that the Johnson Company, of Lorain, O., and Johnstown, Pa., has acquired the sole manufacturing and selling rights for this tie plate. Naturally, it is fair to assume that the company has full confidence in the future of this appliance. It has made some improvements in the method of rolling up the lugs. It will be remembered that these are placed transversely of the tie, and that there are four under the ordinary plate. The plate also has a shoulder to take the outward thrust of the rail. The Johnson Company has great manufacturing and business facilities and experience, and will doubtless push this plate with energy. Mr. Floyd K. Smith is in charge of this branch of the business of the company.

##### Crossing of Overhead Trolley Railroads.

Judge Dunbar, in the Superior Court at Boston, has confirmed the report of the Railroad Commissioners as to the manner in which the Hingham & Nantasket Street Railroad shall cross the tracks of the New York, New Haven & Hartford, on Rockland street, at Weir River, Hingham, and near Hotel Nantasket in Hull. Both roads have overhead electric trolleys at these



places, and this is the first time the question has arisen as to the manner in which it is most feasible that such roads shall cross each other. The Commissioners found that the continuity of the trolley of the New Haven road should not be broken, but that it should remain as it is, and that the defendant (the Hingham Company) shall construct a swinging arm on either side of the plaintiff's railroad, and when it has occasion to cross the arms shall be swung together so as to give it a continuous trolley to get it safely across, and as soon as the car shall have passed over the plaintiff's tracks the arms are to be swung back again.

#### THE SCRAP HEAP.

##### Notes.

Mr. Streeter has applied to the Chicago city officials for leave to show one of his collisions on the yard tracks of the Illinois Central at 95th street, Chicago.

Three highwaymen stopped a passenger train of the Chesapeake & Ohio, near Kanawha Falls, W. Va., on the night of June 11, but were beaten off by the train men. Three men were arrested the next day.

The McGregor Division of the Chicago, Milwaukee & St. Paul, many miles of the roadbed of which was washed away about three weeks ago, was opened June 11. Nine bridges were destroyed on this division by that storm.

Near Erie, Pa., on June 12, a freight train was boarded by a gang of about 40 tramps, and, intimidating the crew, they opened half the cars in the train and supplied themselves with suits of clothes and other things which they found. Policemen were secured from Erie and after a hard chase 13 of the tramps were caught.

Three mail cars to run on street railroads are now being built in San Francisco, for use in that city. One is to be propelled by electricity one is a broad-gage cable car and the third a narrow-gage cable car. The cars are 26 ft. long, but the main room occupies only 16 ft., a space of 5 ft. at each end being partitioned off for the motorman.

##### Horseless Omnibuses.

A reference is made in the *Electrical Review*, of London, to the prospect of a company being formed to run electrical omnibuses in London. The itemized cost of operating over 900 omnibuses by horses for six months in that city is given, covering a total mileage of over 10 million and is found to be 10.64 cents per omnibus per mile, exclusive of drivers, conductors, office expenses and general administration. The estimated cost of running these omnibuses electrically is also given and is found to be 4.88 cents, exclusive of the same items.

##### New Railroad in Costa Rica.

Preliminary surveys are being made under the supervision of the Costa Rican Government for the construction of a railroad from San Jose, the capital, to Punta Arenas, on the western coast. This railroad has been contemplated for some time. It will be 35 miles long. There is already a road from Limon, on the Atlantic coast, to San Jose, so if the new project is carried out there will be direct communication between the two oceans. Both Limon and Punta Arenas are important seaports.

##### New Coal Pier at Port Reading.

Contracts have been let by the Philadelphia & Reading for the construction of a large additional coal pier at Port Reading. It will be 700 ft. long and 50 ft. wide, and will be separated from the present wharf by a dock 200 ft. wide. The new pier will have three tracks, the third being intended to return the empty cars by gravity. The dock will be dredged to a mean depth of 18 ft. at low water. The contract for the new pier has been awarded to Joseph H. Cofrode, formerly of the bridge-building firm of Cofrode & Saylor. The dredging will be done by J. Sanford Ross, of Jersey City. This pier will enable the company to increase its facilities for handling its tidewater coal, and is in pursuance of the plan to ship coal for New York and New England tidewater points over the Plymouth branch, and thence over the Bound Brook road to Port Reading. By making Port Reading the distributing point for this traffic a considerable distance in vessel haul will be saved.

##### The Moving Sidewalk.

We learn that the movable sidewalk or continuous railroad, which many people will remember having seen on the pier at the World's Fair, has been a great success at the Berlin Exposition. As many as 35,000 passengers have been carried in one day, and the enterprise is popular and promises to be profitable.

##### The Uganda Railroad.

A memorandum relating to the Uganda Railway bill has been issued as a Parliamentary paper. Early in 1895 the question was referred to a committee, which concluded that it might be possible to construct a line of 3-ft. gage and with very light rails for £1,755,000. Later in the year it was decided that a railroad should be built. A vote of £30,000 was taken in August for preliminary expenses, and a committee was appointed to superintend the undertaking. It is now found that, in view of the various considerations and of unforeseen contingencies, the committee would not be justified in advising the provision of a less sum than £3,000,000. The estimate for the work of the current year is £520,000, less the £30,000 already voted. It is hoped that as much as 100 miles of line may be laid during the financial year, and that the materials for 100 more may be provided. The Chief Engineer (Mr. Whitehouse) and the principal members of his staff arrived at Mombasa on Dec. 11, and commenced preliminary work for the reception of laborers and stores. Eleven hundred coolies and artisans from India are now on the spot, 1,000 more are expected, and it has been found practicable already to employ native labor. Plant and material for about 30 miles of railroad have been purchased and despatched.

##### Another Pass Fraud.

An officer of an Eastern railroad sends us two interesting letters. The first is written on the letter head of the Pacific Coast Steamship Company, and dated San Francisco, May 14. This letter head also bears the name of E. Walter Smythe, General Superintendent, and the usual formula denotes that the letter was dictated by E. W. S. and that it is No. 1983. With a few omissions Mr. Smythe's letter is as follows:

"It is my intention to start on the day after to-morrow for a trip eastward as far as New York and Boston. I have the requisite transportation for myself over your road. Enclosed you will please find addressed envelope to myself in the care of my friend ——. If consistent with your rules would you extend courtesy of trip pass from Buffalo to New York and return for Mrs. E. W. Smythe, and also trip pass for my son, Mr. Walter Smythe (who is my secretary) from Buffalo to New York and return? Account P. C. S. S. Co. Good until June 30, 1896. The courtesy requested will be appreciated by

(Signed) E. WALTER SMYTHE,

General Superintendent.

The second letter is from Messrs. Goodall, Perkins & Co., general agents of the Pacific Coast Steamship Co., dated San Francisco, May 28, and addressed to general managers of railroads. That letter follows in full:

"We are this day in receipt of a letter from the General Manager's office of the Denver & Rio Grande Railroad Co. inclosing a letter written on a Pacific Coast Steamship Co.'s letter head, signed 'E. Walter Smythe, General Superintendent,' asking for transportation on account of the Pacific Coast Steamship Co.

"This is to notify transportation companies that E. Walter Smythe is a fraud and is unknown to this company. The letter head on which application for pass was made is bogus and printed evidently for the purpose of misleading transportation companies, as all letter heads of the Pacific Coast Steamship Co. bear only the name of Goodall, Perkins & Co., General Agents."

We suppose that it is not necessary for us to express any opinion of Mr. Smythe and his methods. He belongs to a class of frauds which is slowly being exterminated.

##### Lake Notes.

Plans have been made for the use of the appropriation of \$3,085,000 made by the River and Harbor bill for deepening the harbors of Duluth and Superior, to be spent in the next four years, and work will begin as soon as the money is available. The channels outside the private dock lines will be deepened to 20 ft., at first in a narrow canal and then wider. The appropriations made in the past for these combined harbors have never averaged more than \$80,000 a year, but an annual outlay of \$750,000 is now to be available. About \$50,000 will be spent this year in preparation.

The Canadian ship canal at St. Mary has this season passed about 25 per cent. of the tonnage, against a very small share last fall. After Aug. 1 it is likely to have all the larger craft, as at that time the work of the 21-ft. channel in the Sault River, below the canals, will have been completed and two vessels can go in and out drawing 18 to 19 ft., the depth of the Canadian lock being 19.5 ft. The new American canal can not be used until late this season. Now the draught at the Sault is but 14 ft., and the change will add from 300 to 400 tons for every additional foot for every one of the larger boats. It means a vast addition to the capacity of the great lake fleet.

#### LOCOMOTIVE BUILDING.

The Richmond Locomotive Works has just received an order from the Cleveland, Cincinnati, Chicago & St. Louis to convert 60 locomotives from simple to compound engines as fast as they can be put through the shops.

A contract has been awarded by the Baltimore & Ohio to the Pittsburgh Locomotive Works, Pittsburgh, Pa., to build 20 consolidation locomotives. They will have 22 in. x 28 in. cylinders. With this order there are now 55 new locomotives under contract for the road. Twenty more are yet to be ordered.

The Imperial Railways of North China have issued an advertisement for proposals for supplying four passenger and four freight locomotives for use on the extension of the road from Tien Tsin to Lu-Kun-Chiao. The proposals will be opened at the company's office at Tien Tsin, Aug. 25. This information is forwarded to Washington by the American Consul at Tien Tsin.

#### CAR BUILDING.

Eight new day coaches and six new Wagner sleeping cars have just been put into the daily through service between New York and Montreal, over the Adirondack & St. Lawrence division of the New York Central. The day coaches have accommodations for first and second-class passengers. New mail and express cars will also be run on these trains.

#### BRIDGE BUILDING.

**Buffalo, N. Y.**—Press reports state that the Council is soon to order the construction of a new iron bridge across Cazenovia Creek at Cazenovia street. The cost will be about \$25,000.

**Burlington, Ia.**—The Milwaukee Bridge and Iron Co., having bid \$13,900 for the superstructure of the Cascade bridge, has been awarded the contract. The substructure, consisting of abutments, piers and trestle tower pedestals, will be built by the city. Concrete will be used instead of masonry. The work must be completed, ready for travel, by the 1st day of September, 1896.

**Du Bois, Pa.**—A new bridge is being erected over Sandy Creek in place of the structure torn down.

**Elizabeth, N. J.**—The County Board of Freeholders has decided to build an iron bridge over the Elizabeth River at South street.

**Fall River, Mass.**—Bids on the proposed new bridge across Taunton River, at Berkley, have been received as follows: Toledo (O.) Bridge Co., \$27,500; Norton Iron Co., Everett, Mass., \$33,241; Boston (Mass.) Bridge Works, \$24,890; King Bridge Company, Cleveland, O., \$24,645; Berlin Iron Bridge Co., \$24,990; New Jersey Steel Co., Trenton, N. J., \$28,000; Chauncey Sears, Fall River, Mass., \$23,995; Beattie & Wilcox, Fall River, Mass., \$23,500. The County Commissioners will meet soon, when the contract will probably be awarded.

**Glassport, Pa.**—Latest reports state that the erection of the new bridge over the Monongahela River between Glassport and Mendelssohn is to be commenced shortly. Instead of being double deck it will be a single-floor bridge, similar to the new bridge at Elizabeth. It will be wider, however. The cost will be about \$160,000.

**Hartford, Conn.**—The temporary bridge across the Connecticut River, built by the Berlin Iron Bridge Co., has been opened, although the ice ballast, which will be about 20 ft. in height, is yet to be built. This bridge is a substantial structure, costing \$38,000.

**Ithaca, N. Y.**—The contract for the new iron bridge across the Chenango River has been awarded to the Groton Bridge Co. for \$3,000.

**Nashville, Tenn.**—It is stated that the special committee on the terminal bill has decided to recommend the building by the city of the approaches to the Broad and Church street viaducts, instead of the appropriation of \$100,000 to the Terminal Company, as originally contained in the ordinance.

**New Haven, Conn.**—The contract for the structure of the new drawbridge across the Quinnipiac River was awarded to the Berlin Iron Bridge Co. for \$56,451. The other bids submitted were as follows: Wrought Iron Bridge Co., Canton, O., \$57,777; King Bridge Co., Cleveland, O., \$59,775; Penn Bridge Co., Pittsburgh, \$59,900; Boston (Mass.) Bridge Co., \$71,949; Edge Moor Bridge Works, Wilmington, Del., \$66,440; Penn Steel Co., Steelton, Pa., \$61,881; J. E. Buddington, New Haven, \$65,990; Benner & Opdyke, Philadelphia, \$65,977; Canton (O.) Bridge Co., \$65,000; R. F. Hawkins Co., Springfield, Mass., \$79,159; Dean & Westbrook, New York, \$65,000; Youngstown (O.) Bridge Co., \$60,006; F. R. Long, New York, \$69,000; N. J. Steel and Iron Co., Trenton, \$69,980; Groton (N. Y.) Bridge Co., \$73,400; New Columbus Bridge Co., Columbus, O., \$65,187; Massillon (O.) Bridge Co., \$64,600; Toledo (O.) Bridge Co., \$64,900.

**Northumberland, N. Y.**—The award of the contract for the construction of the iron bridge over Champlain Canal was given to Cunningham & Monty, of Sandy Hill, for \$3,490. The bidders were: Wrought Iron Bridge Co., Canton, O., \$3,755.06; Frank Pidgeon, Saugerties, \$4,458.92; Dempsey & Sturbrant, Sandy Hill, \$3,555.16; Flood & Sherrill, Sandy Hill, \$3,856.32.

**Philadelphia.**—Broad street is to be carried over the Reading subway on a five-span steel girder bridge, 265 ft. long and 113½ ft. wide, with driveway paved with asphalt on a concrete base. The estimated cost is about \$100,000, of which about \$16,000 will be for the ornamental railing.

**Raleigh, N. C.**—The Southern Railway has begun a steel bridge across the Yadkin preparatory to doubling-track its line between Charlotte and Greensborough.

**Salt Lake City, Utah.**—Bids will be received until July 6 for building a highway bridge over the River Jordan. C. E. Stanton is County Clerk.

**Sioux City, Ia.**—Plans have recently been completed for the new Yankton & Norfolk railroad bridge across the Missouri River at Yankton. Provision is made for five pneumatic piers, an iron bridge proper 1,000 ft. long and 1,500 ft. of approaches. The total cost of the structure is estimated to be about \$500,000.

**Syracuse, N. Y.**—The contract for constructing two stone abutments and building a steel girder bridge across Onondaga Creek was awarded to the Wrought Iron Co., Canton, O., for \$7,540. Other bids were Hughes Bros., \$8,272 and Groton (N. Y.) Bridge Co., \$8,180.

**Washington, D. C.**—The following bills have been signed by the President: Authorizing the construction of bridges over the Warrior, Cahaba and Alabama rivers by the Mobile & Ohio Railroad; over the Allegheny River by the Butler & Pittsburgh Railroad; over the St. Louis River near Fond du Lac by St. Louis County, Minn.

**Wellsborough, Pa.**—The Commissioners have let contracts for a 185-ft. span iron bridge across the Tioga River at Canoe Camp to the Owego Bridge Co. for \$4,750; a 78-ft. span iron bridge over Crooked Creek to Nelson & Buchanan, of Chambersburg, for \$1,450; a 68-ft. span iron bridge across Crooked Creek, Middlebury, to Nelson & Buchanan, for \$1,300; the bridges to have 16-ft. roadway. The abutments of the Little Marsh bridge will be built by C. N. Butts, of Sabinsville, for \$4.75 a cubic yard for the masonry and 30 cents a lineal foot for piles. The contract for the masonry of the Middlebury bridge has been let to Milford H. Stebbins, of Wellsboro, for \$4.25 a cubic yard and 30 cents a foot for piles.

**West Chester, Pa.**—Plans for a bridge to avoid the grade crossing at the Greene Hill, on the Frazer Branch of the Pennsylvania Railroad, are being considered.

**Westfield, Mass.**—The officers of the town and those of the Boston & Albany Railroad have agreed upon the details of the bridge at Elm street to be built for the purpose of carrying the tracks above the street at that point, and an order will soon be issued by the Superior Court approving the agreement and authorizing the commencement of the work. The officers of the road say it will be begun at once.

**West Newton, Pa.**—A new bridge is projected for this vicinity. It is to cross the Youghiogheny River at Smithtown, six miles up the Yough Valley from this place, and will be built of steel.

**Williamstown, Mass.**—The contract for the new bridge at Cole's switch has been awarded to the R. F. Hawkins Iron Works, of Springfield. The price agreed upon is \$5,670.

#### RAILROAD LAW—NOTES OF DECISIONS.

##### Carriage of Goods and Injuries to Property.

The Supreme Court of Missouri holds that where a railroad issues original shipper's order bills of lading, declaring that the consignment is in its possession, to be delivered only on their presentation, not conditioned to be void in case of delivery on duplicate bills issued for protection, the company will be liable on its original bills to one holding them as assignee for a valuable consideration, though it has already delivered the freight to the shipper on his presenting one of the duplicate bills.

In Texas it is held that a stipulation, in a contract of carriage of cattle, that recovery cannot be had for injury at any place where they may be unloaded during the trip, unless the shipper give notice to the station agent at that point, before they are removed therefrom, specifying the nature of his claim, is unreasonable, in a case where they are not given room to eat and drink, the injury from which afterwards appears.

In the District of Columbia the liabilities of a carrier depend not only on his contract, but also on obligations imposed by law; and an action may be brought either on the contract or for negligence or damage to person or property, as the case may be.

In New York the Supreme Court rules that where defendants, common carriers, broke, in handling, a machine they were moving for plaintiff, they were not relieved from liability therefor because plaintiff insisted on having the machine placed after dark, defendants having the right to refuse, or to stipulate for immunity from damages if it increased their risk as insurers.

The Supreme Court of Illinois holds that where a rail-



road undertakes to carry hams in a refrigerator car, and they are damaged in transit by reason of a defect in the car, the company is not relieved of responsibility therefor by the fact that it had the car inspected by the packer from whom the hams were brought.<sup>6</sup>

In Kansas it is decided that a railroad is not bound to fence shut a private gate erected in its right of way fence at a private crossing.<sup>6</sup>

#### Injuries to Passengers, Employees and Strangers.

In Georgia the Supreme Court rules that where it appeared that plaintiff, on entering defendant's sleeping-car, was told by the conductor that the car would go through to his destination and that he might go to bed; that on retiring he deposited his money in an envelope, put the envelope in his vest pocket and placed the vest under his pillow; that in the middle of the night, before reaching his destination, he was suddenly aroused and told to hurry to get into the next car, as the car which he was in was to be taken no further; whereupon he rose hurriedly and carried his clothes to the next car, and that he discovered the loss of the envelope an hour later and duly notified the company—it was error to grant a nonsuit.<sup>7</sup>

In West Virginia it is held that a ticket issued through fraudulent representations that the one to whom it was issued was the editor of a newspaper in which the railroad company advertised, could be taken up and canceled by the company.<sup>8</sup>

In Michigan it appeared that at a certain station the only light at the platform, which was 189 ft. long and 12½ ft. wide, was one lamp; and that plaintiff went to such station at night to take a train. He testified that he saw the train coming and started to go forward to where he thought the baggage car would stop so as to put a package on it; that as he went away from the lamp it was pretty dark; that he stepped off the platform on the track and was struck by the engine; and that he knew it was dark, but thought he would be safe in going up there. The Supreme Court rules that a direction of a verdict for defendant was proper.<sup>9</sup>

The Court of Appeals of New York decides that a rule of a street railroad company that "smoking on closed cars is prohibited, except on the front platform," modifies a notice, placed in the car, prohibiting passengers from standing on the platforms, and operates as a waiver of any immunity from liability or injury to one while smoking on such platform.<sup>10</sup>

In New York it is laid down that where a passenger buys an excursion ticket containing a return coupon, and the conductor of the outgoing train takes the return coupon, the railroad company is not liable because the conductor of the returning train refuses to accept the other part of the ticket, and ejects the passenger, if the passenger, before entering the returning train, could, by using ordinary diligence, have discovered the mistake of the other conductor.<sup>11</sup>

In Michigan the Supreme Court decides that a passenger who has had mileage taken from his book by the conductor for his entire trip, but who, at an intermediate station changes his seat, cannot recover for being ejected on his refusal to pay when fare was afterward demanded, he having simply said he had paid his fare, and, on being asked where to, told the conductor that he ought to know; that it was his business to know—language which on a former occasion the conductor had used to him—and having, when the conductor for the first time recognized him, asked him to get on again, refused to do so, with the statement that he would fix him.<sup>12</sup>

In Texas it is decided that where two railroad companies employ the same ticket agent and use the same track, and it was the custom for each company to accept the tickets of the other on its trains, and the agent after selling a passenger a ticket of one company, directs him to get on a train of the other, and the conductor refuses the ticket and ejects the passenger, both companies are liable.<sup>13</sup>

In Texas it is held that where a station is duly called by the brakeman, and a passenger, relying on the promise of the conductor to notify him personally when the train arrived there, fails to hear it announced, and is carried past, her whole attention being occupied at the time by a sick child, the carrier is not responsible, unless the conductor had knowledge of the child's illness, or of the necessity that might require the mother's exclusive attention to its needs, when he made the promise.<sup>14</sup>

In Massachusetts it is held that the foreman of a switching gang, who merely points out to the conductor of the switching train where he wishes the cars placed, has not "charge or control" of the train, within the meaning of a statute, giving an employee, injured through the negligence of one so "in charge or control" a right of action against the employer.<sup>15</sup>

The Supreme Court of Montana rules that where, for the purpose of using a road engine as a switch engine, a flat car is put in front of it, it is a sufficient showing of negligence, to go to the jury, that the brake staff on the end of the car, used in connection with the brake beam by brakemen in mounting the car, is bent, so that it turns in the hands of a brakeman mounting the car, and causes him to lose his hold.<sup>16</sup>

In Texas it is laid down by the Federal Court that a railroad is bound to furnish safe machinery and appliances for use by its employees, but not to insure the absolute safety thereof, or to provide the best, safest or newest machinery and appliances. If ordinary and reasonable care is not exercised to provide safe machinery, the company is responsible for injuries resulting from such neglect. The neglect of the servant to whom is intrusted the duty of inspection and repair is the neglect of the master.<sup>17</sup>

In Massachusetts it is ruled that a number of cars coupled together, and moving from one point to another from an impetus imparted by a locomotive which had been detached, is a "train," so as to entitle an employee of the railroad company to recover for injuries due to the negligence of the person in charge or control thereof.<sup>18</sup>

In the same case it is held that brakemen on cars which are moving from the impetus imparted by a locomotive shortly detached therefrom have not "charge or control" of the cars, so as to entitle employees injured by their negligence to recover therefor from the railroad company.<sup>19</sup>

In New York, while plaintiff was crossing defendant's southbound track, about 8:30 o'clock at night, a wheel of his carriage came off, forcing the axle into the crossing planks. After extricating the axle plaintiff searched for the wheel, replaced it, and then, instead of getting off the track, searched for the nut, after finding which he went to the horse's head, which was over the northbound track, and was immediately struck by a train which he knew was due to leave the village, a mile south of the crossing, at 8:28 p. m. There was a headlight on the engine, which could be seen for 2,800 ft., the track being unobstructed for that distance, and the noise of an approaching train could be heard for three-quarters of a mile. Whether the bell was rung was disputed, but no whistle was sounded, and plaintiff testi-

fied that, while on the track, he looked and listened several times for the train. The Supreme Court holds this insufficient to show absence of contributory negligence.<sup>20</sup>

The Supreme Court of Texas holds that where a locomotive, with its headlight in a leaking condition, was used as a switch engine in the yards, and an engineer on a road engine was killed in a collision therewith, by reason of being unable to see the switch engine, and the failure of the yard foreman and crew to notify him of the presence of the switch engine and cars on the main track, defendant is liable, even though the engineer of the switch engine be considered as a fellow servant, as the fact that a fellow servant merely contributed to the injury will not relieve defendant from liability.<sup>21</sup>

The Supreme Court of the United States decides that the foreman of a drill crew, who works with the rest of the crew in moving cars in a railroad yard and placing them on floats, and who is subordinate to the yardmaster, who employs and discharges all employees in the yard, is a fellow servant of the other members of the crew.<sup>22</sup>

In Texas it is held that a person employed by a railroad to inspect its locomotive boilers, and cause repairs to be made when necessary, is not a fellow servant of other employees about the yards of the company.<sup>23</sup>

<sup>1</sup> Midland Nat. Bank v. M. P., 33 S. W. Rep., 521.

<sup>2</sup> G. C. & S. F. v. Stanley, 33 S. W. Rep., 109.

<sup>3</sup> Cent. Trust Co. v. E. T. V. G., 70 Fed. Rep., 764.

<sup>4</sup> Jackson A. I. W., v. Hurlbut, 36 N. Y. S., 808.

<sup>5</sup> C. & A. v. Davis, 42 N. E. Rep., 382.

<sup>6</sup> Rouse v. Osborne, 42 Pac. Rep., 843.

<sup>7</sup> Kates v. P. C. Co., 23 S. E. Rep., 186.

<sup>8</sup> Moore v. O. R., 23 S. E. Rep., 539.

<sup>9</sup> Bradley v. G. T., 65 N. W. Rep., 102.

<sup>10</sup> Vail v. Broadway, 42 N. E. Rep., 4.

<sup>11</sup> Wiggins v. King, 36 N. Y. S., 708.

<sup>12</sup> White v. G. R. & I., 65 N. W. Rep., 521.

<sup>13</sup> T. & P. v. Dye, 33 S. W. Rep., 551.

<sup>14</sup> C. R. I. & T. v. Boyles, 33 S. W. Rep., 247.

<sup>15</sup> Caron v. B. & A., 42 N. E. Rep., 112.

<sup>16</sup> Prosser v. Montana Cent., 43 Pac. Rep., 81.

<sup>17</sup> T. & P. v. Thompson, 70 Fed. Rep., 944.

<sup>18</sup> Caron v. B. & A., 42 N. E. Rep., 112.

<sup>19</sup> Caron v. B. & A., 42 N. E. Rep., 112.

<sup>20</sup> Belch v. N. Y. Cent. & H. R., 36 N. Y. S., 56.

<sup>21</sup> San Ant. & A. P. v. Harding, 33 S. W. Rep., 373.

<sup>22</sup> C. R. R. of N. J. v. Keegan, 16 S. Ct., 209.

<sup>23</sup> T. & P. v. Thompson, 70 Fed. Rep., 944.

#### MEETINGS AND ANNOUNCEMENTS.

##### Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

*Chicago & Eastern*, quarterly, 1½ per cent. on preferred stock, payable July 1.

*Chicago Junction Railway & Union Stock Yards Co.*, quarterly, 1½ per cent., payable July 1.

*Manhattan Railway Co.*, quarterly, 1½ per cent., payable July 1.

*New York & Harlem*, 4 per cent., payable by the New York Central, lessee, July 1.

##### Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

*New York & Harlem*, special, Grand Central station, New York City, July 15.

*Saginaw Valley & St. Louis*, annual, company's office, St. Louis, Gratiot County, Mich., July 8.

*Saginaw & Western*, annual, Alma, Gratiot County, Mich., July 8.

##### Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Master Mechanics' Association* will hold its next annual convention at Congress Hall, Saratoga Springs, beginning June 22.

The *American Street Railway Association* will hold its annual convention at St. Louis on Oct. 24 and 25.

The *Roadmasters' Association of America* will hold its next annual meeting at the Cataract Hotel, Niagara Falls, N. Y., beginning Sept. 8.

The *American Society of Civil Engineers* will hold its annual convention at San Francisco, beginning on or about June 30.

The *Canadian Society of Civil Engineers* will hold a special summer meeting at Toronto beginning June 17.

The *Traveling Engineers' Association* will hold its next annual meeting at Minneapolis, Minn., commencing Sept. 8.

The *Roadmasters' Association of America* will hold its next annual convention at Niagara Falls, beginning on Sept. 8.

The *Railway Signalling Club* will meet on the second Tuesday of the months of January, March, May, September and November, in Chicago. Mr. George M. Basford, is secretary, The Rookery, Chicago.

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *New York Railroad Club* meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m., except in June, July and August.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Tuesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2:30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.

The *Western Society of Engineers* meets in its rooms on the first Wednesday of each month, at 8 p. m., to hear reports, and for the reading and discussion of papers. The headquarters of the Society are at 1736-1739 Monadnock Block, Chicago.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1422 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m.

The *Boston Society of Civil Engineers* meets at 715 Tremont Temple, Boston, on the third Wednesday in each month, at 7:30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' Society of Western Pennsylvania* meets in the Carnegie Library Building, Allegheny, Pa., on the third Tuesday in each month, at 7:30 p. m.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Association of Engineers of Virginia* holds informal meetings on the third Wednesday of each month, from September to May, inclusive, at 710 Terry Building, Roanoke, at 8 p. m.

The *Denver Society of Civil Engineers* meets at 36 Jacobson Block, Denver, Col., on the second Tuesday of each month except during July and August.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7:30 p. m.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 24 West Fourth street, Cincinnati, O., on the third Thursday in each month, at 7:30 p. m. Address P. O. Box 333.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday each month at 8 p. m.

The *Western Foundrymen's Association* meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. S. T. Johnston, Monadnock Block, Chicago, is secretary of the association.

The *Engineers' Club of Columbus, (O.)*, meets at 12½ North High street, on the first and third Saturdays from September to June.

The *Engineers' and Architects' Association of Southern California* meets each third Wednesday of the month in the Hall of the Chamber of Commerce, Los Angeles, Cal.

The *Engineers' Society of Western New York* holds regular meetings the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

The *Civil Engineers' Society of St. Paul*, meets on the first Monday of each month, except June, July, August and September.

The *Engineers' Society of Western New York* meets on the first Monday of each month at the Society's rooms in the Buffalo Library.

##### The Civil Engineers' Club of Cleveland.

A meeting of the Civil Engineers' Club of Cleveland was held June 9, President Howe in the chair. Dr. C. O. Arey presented an exhaustive and interesting paper upon "Water Supply and Sewerage as Affected by the Lower Vegetable Organisms."

Mr. E. A. Sperr was elected to active membership.

##### Train Dispatchers' Association.

The ninth annual convention of the Train Dispatchers Association of America was held at Fortress Monroe Va., June 16. About 35 members were present. Interesting papers were read and a number of new members were elected. The next meeting will be held at Detroit, June 23, 1897. The President of the Association is J. G. Sickels (C. R. I. & P.), Blue Island, Ill., and the Secretary is J. F. Mackie, Chicago.

##### St. Louis Railway Club.

The St. Louis Railway Club held its regular monthly meeting at the Southern Hotel, St. Louis, June 12. There were 300 members and visitors present. President Frank Reardon presided. H. H. Roberts, local manager of the *Iron Age*, was elected Secretary. The Secretary reported that the club membership had increased to 700. After the regular business meeting the club was addressed by Frederick W. Lehman.

##### Traveling Engineers' Association.

The committee on the subject of discipline sends out a circular asking questions on the subject preparatory to making its report for the next convention, which meets Sept. 8. The questions cover fines for violation of rules or damage to the property, suspensions, feeling of engineers when a fellow employee is suspended, and the brown system. Members are requested to fully explain the discipline on their respective roads. Answers should be sent to H. G. Brown, C., M. & St. P. Ry., Dubuque, Ia.

##### Engineers' Club of St. Louis.

On June 3, President Ockerson called the club to order 18 members and four visitors present.

The committee to whom was referred the bill to establish engineering experimental stations throughout the United States reported as follows: "The bill provides for giving to each state and territory \$10,000 a year, this sum to be increased by \$1,000 annually for 15 years, until the sum amounts to \$25,000 a year for each state and territory, and to remain at this figure thereafter, for the purpose of providing for engineering experiments in these several states and territories. In other words, upward of \$1,250,000 annually is to be donated by the general government for engineering experimentation in about 50 different laboratories, most of which are now and would remain in relatively incompetent hands."

"There is now expended for experimental work on the strength of materials at the Watertown Arsenal the sum of \$10,000 per annum, and this small amount has proved sufficient for many years to maintain that work on a high plane of accuracy and efficiency. It seems hardly possible that the proposed large sum could be profitably spent in 50 different educational institutions, with anything like an adequate return to the cause of scientific experimentation. If engineering experiments are carried out by inexperienced and incompetent persons, and the results published by the general government, as is here proposed, these results are likely to be more or less erroneous and misleading, and might prove to be of more injury than benefit in engineering practice."

"It is recommended therefore that no action be taken on this bill by the Engineers' Club of St. Louis."

This was signed by J. B. Johnson, Committee, and was adopted.

The Secretary then read a letter from the Secretary of the American Society of Mechanical Engineers, thanking the club for courtesies and hospitality.

Mr. F. B. Maltby read a paper on "Methods and Results of Stadia Surveying," treating the subject from the standpoint of a wide practical experience. He went into the details of the work at some length regarding the appliances necessary, force required, necessity of sketching, speed with which such work could be conducted and



the cost of same, showing some charts from actual service. Mr. J. L. Van Ornum contributed a written discussion. Messrs. Colby, Thomas, Turner, Jolley, Ockerson and Russell also took part in the discussion.

Mr. Julius Baier showed the club a number of photographs, showing the damage done by the recent tornado, and discussed it from an engineering standpoint. An informal discussion followed, participated in by nearly all present, after which the meeting adjourned.

#### PERSONAL.

—Mr. H. F. Garrett, formerly Master Mechanic of the Richmond & Danville, has been appointed to a similar position on the Southern Railway in Birmingham, Ala.

—Mr. H. N. Woodward, of Philadelphia, Pa., has been appointed Master Mechanic of the Baltimore & Ohio shops at Parkersburg, to succeed Mr. J. H. Irvin, assigned to other duties.

—Mr. Harry J. Graham, for several years General Agent of the Lake Erie & Western at Peoria, Ill., has been appointed Assistant General Freight Agent, and will remove to Indianapolis.

—The report that Mr. W. S. Lincoln, Chief Engineer of the Wabash road, has resigned, which has been printed in a number of the Western papers in the past few days, we are authorized to deny.

—Mr. W. R. Stirling has resigned the Vice-Presidency of the Illinois Steel Co. in order to devote his entire time to the Universal Construction Company, which recently leased the north works of the Illinois Steel Co.

—Mr. E. E. Gerkins has been appointed Assistant General Freight Agent of the Michigan Central, with office at Bay City, Mich., vice, Mr. W. L. Benham resigned. Mr. G. W. Bailey succeeds Mr. Gerkins as Commercial Agent at Toledo.

—Mr. E. L. Stiles has just retired from the position of Station Agent of the Chicago, Milwaukee & St. Paul at Rockton, Ill., after a continuous service of 40 years at the same station. When Mr. Stiles began, in 1856, the name of the road was the Racine & Mississippi.

—Mr. Andrew S. Van Kuren, Freight Auditor of the Union Pacific, died at his home in Omaha on Sunday, of pneumonia. Mr. Van Kuren had been a resident of Omaha for 25 years, and all that time he was connected with the Union Pacific in its auditing department. He held his last office ten years.

—Mr. Thomas Sergeant Fernon, who was the first President of the North Pennsylvania Railroad Company, and subsequently President of the Chester Valley road, both now operated by the Philadelphia & Reading, died at Philadelphia June 16. He had been a State Senator and Representative.

—Superintendent G. W. Conklin, of the Buffalo, Attica & Arcade Railroad, has sold his interest in the road, and will resign about Aug. 1. Mr. Conklin, who was formerly Division Superintendent on the Erie road, became interested in the road about two years ago, and has rebuilt its 30 miles of track.

—Mr. Ralph Peters, general agent and superintendent of the Pennsylvania, at Cincinnati, has been appointed superintendent of the Cincinnati, Lebanon & Northern, in addition to his other duties. The Pennsylvania recently acquired the road, and the appointment brings its operation directly under the control of the company.

—Mr. W. B. McClellan, who resigned as General Passenger Agent of the Hoosac Tunnel & Wilmington road in Vermont last December, and who since that time has been engaged in business at Wheeling, W. Va., has returned to railroad work and will assume his old position as General Passenger Agent at Wilmington, Vt.

—Mr. Edmund Wragge, who has been local Manager of the Grand Trunk in Toronto for 15 years, will retire from that position within a few days, and the place will be abolished. Mr. Wragge's most important recent work has been the building of the new Union Station at Toronto, used by the Grand Trunk and the Canadian Pacific.

—Mr. George M. Burns, who was appointed Fuel Agent of the Wabash a few months ago, has also been appointed Secretary to the General Manager. He formerly held a similar office when Mr. Ramsey was General Manager of the Big Four road. He went to the Wabash about two months ago, being then in the service of the Cincinnati Southern.

—Mr. C. T. Wight, Commercial Agent of the Baltimore & Ohio at Toledo, has been made Division Freight Agent in Ohio. His headquarters will be transferred to Sandusky. Mr. Wight has been Commercial Agent for the company at Toledo for the last five years. He has been with the Baltimore & Ohio a long time as Chief Clerk in the freight office at Cincinnati and Chicago and as agent of the freight department at Des Moines and Omaha.

—Mr. W. L. Denham, Assistant General Freight Agent of the Michigan Central at Bay City, Mich., has resigned to accept an office in the freight department of the Great Northern. His title has not yet been announced, but it is understood that he will have charge of the interests of the freight department at Seattle, Wash. He has been Assistant General Freight Agent of the Michigan Central since 1886 in charge of the freight traffic on the Mackinaw and Saginaw divisions.

—Mr. Timothy Blackstone, President of the Chicago & Alton, has given a library to the town of Branford, Conn., his birthplace, and the library building was formally presented to the town on June 17. Prof. Arthur T. Hadley, of Yale University, and Judge Lynde Harrison, of New Haven, made addresses on the occasion. The library building is of Tennessee marble, and has been building three years. Its cost has been about \$300,000. The architect is S. S. Beeman, of Chicago.

—Mr. Walter Freeman, for many years in the service of the Pennsylvania, died at Philadelphia last week. Mr. Freeman was born in Rahway, N. J., in 1825. He took a position with the Camden & Amboy road, in its early days, and subsequently when the line was leased to the Pennsylvania he became General Freight Agent of the United Railroads of New Jersey. This post he was obliged to resign in consequence of failing health. After returning from a trip in Europe he was made Coal Commissioner of the Pennsylvania and Baltimore & Ohio Railroads. In 1883 Mr. Freeman retired from active work.

—Mr. Abram G. Amsden, Superintendent of the Kalamazoo Division of the Lake Shore & Michigan Southern, died at Grand Rapids, Mich., last Friday. Mr. Amsden entered upon railroad work in 1871, and was continu-

ously in the service of the Lake Shore. He began as a clerk, served a year as cashier at South Bend, was for three years clerk to the superintendent of the Michigan Division, was for six years Assistant Superintendent of the Kalamazoo Division and then became Superintendent of the Western Division at Chicago, and held that office ten years, until his transfer to the Kalamazoo Division in 1892.

—Mr. Harry I. Miller, Superintendent of the main line of the St. Louis, Vandalia & Terre Haute, has been appointed General Superintendent of the road and his office transferred from St. Louis to Terre Haute. Mr. Miller became Division Superintendent of the Vandalia road a few months ago, soon after the Pennsylvania took direct control of its operations, with Mr. J. J. Turner as Vice-President and General Manager. Mr. Miller had been previously Superintendent of the Pittsburgh, Cincinnati, Chicago & St. Louis at Louisville. He has been Division Superintendent on the Pennsylvania lines since 1888.

—Mr. Elliott Holbrook has been appointed General Superintendent of the Louisville, Evansville & St. Louis, which is now operated by Mr. G. T. Jarvis as Receiver and General Manager. Mr. Holbrook has been recently Chief Engineer of the new Pittsburgh & Northwestern road, and has just completed the surveys for that line. Mr. Holbrook was formerly General Superintendent of the Pittsburgh & Western for about three years up to 1890 when the road came under the control of the Baltimore & Ohio. The line then became the Pittsburgh Division of the Baltimore & Ohio, and he was made Superintendent of that division. He resigned in 1893, and has since been engaged in local enterprises at Pittsburgh.

—Mr. Samuel B. Sweet has been appointed General Freight Agent of the Lake Erie & Western, and as such will have charge of the freight department of the company. Mr. C. H. Daly remains in charge of the passenger department as General Passenger Agent. The office of General Traffic Manager, held by the late Mr. Parker, has been abolished. Other changes in the freight department are the promotion of Mr. A. J. Young, now Assistant General Freight Agent of the Fort Wayne, Cincinnati & Louisville, one of the operated lines of the Lake Erie & Western, to a similar office with the latter company, and the promotion of Mr. H. J. Graham, General Agent of the company, at Peoria, Ill., for a number of years, to be also Assistant General Freight Agent. Mr. Sweet, the new General Freight Agent, has been Assistant General Freight Agent since 1888, and was previously Division Freight Agent. He went to the Lake Erie & Western when that road secured control of the Indianapolis, Peru & Chicago, of which Mr. Sweet had been made General Freight Agent when the line was separated from the Wabash. Previously he had been Division Freight Agent of the Wabash, at Peru, Ind., his railroad service beginning with that company at Fort Wayne.

#### ELECTIONS AND APPOINTMENTS.

**Baltimore & Ohio.**—C. T. Wight has been appointed Division Freight Agent for the Lake Erie and Straitsville Divisions, with office at Sandusky, O.

Mr. E. N. Kendall has been appointed Commercial Freight Agent at Toledo, O., vice Mr. Wight, promoted, with office in the St. Clair Building.

**Brookville.**—The directors of this new Pennsylvania company are Levi Heidrich, President; Brookville, Pa.; R. M. Matson, Brookville; Spencer B. Rumsey, William K. McElroy, Frank M. Ashmead and Edwin P. Bates, of Pittsburgh.

**Chicago Great Western.**—William Lidderdale, formerly Governor of the Bank of England, has been elected Chairman of the Finance Committee of this company.

**Florida, Peninsular & Gulf.**—The directors of this new company, at a recent meeting in Boston, elected the following officers: Chas. H. Foster, Manatee, Fla., President; Woodward Emery, Boston, Vice-President; Chas. A. Rogers, Boston, Treasurer, A. H. Rogers, Secretary; George B. Morton, Baltimore, Md., General Manager and Chief Engineer.

**Great Northern.**—Leroy Tucker, formerly with the Wabash, has been appointed Passenger Agent of the Great Northern, in Detroit, Mich.

**Kansas City, Fort Scott & Memphis.**—A. C. Spofford, of Fort Scott, has been appointed Master of bridges and buildings of the Clinton Division to succeed T. J. Newell. He will have headquarters at Clinton, Mo.

**Lake Erie & Western.**—The following appointments have been made: Mr. S. B. Sweet, General Freight Agent; Mr. A. G. Young, Assistant General Freight Agent, and Mr. H. J. Graham, Assistant General Freight Agent.

**Litchfield, Carrollton & Western.**—C. B. McCall has been appointed Manager of the road by Joseph Dickinson, Receiver, with headquarters in Carlinville, Ill. Otherwise the management will remain the same as under the previous receiver.

**Louisville, Evansville & St. Louis.**—J. C. Murphy has been appointed Road Master of the Eastern Division, with headquarters at Huntingburg, Ind. His supervision will extend over the main line from New Albany to the west end of the Huntingburg yard and over the Evansville Division and branches. G. R. Truville has been appointed Road Master of the Western Division, with headquarters at Mt. Vernon, Ill. His supervision will extend over the main line from Huntingburg yard to East St. Louis.

**Minnesota Transfer.**—At the annual meeting last week at St. Paul the old Board of Directors was re-elected and the following officers: President, John R. Hastings, of the Chicago, Burlington & Quincy; Vice-President, W. P. Clough, of the Great Northern; Secretary, L. A. Robinson, of the Omaha; Treasurer, H. P. Upham; Attorney, W. H. Norris, of the Chicago, Milwaukee & St. Paul.

**Norfolk, Virginia Beach & Southern.**—The stockholders held their first annual meeting in Norfolk, Va., June 13 and elected the following officers: Alfred Skitt, of New York, President; Wm. H. White, of Norfolk, Vice-President and Counsel; John Carstensen, of New York, Secretary and Treasurer; Alfred Skitt, E. V. W. Rossiter, C. W. Wetmore, John Carstensen and W. H. White, Directors, who represent the new interest in the property, formerly known as the Norfolk, Albemarle & Atlantic.

**Ocean City.**—The directors of this new company in New Jersey are: Robert Fischer, R. B. Sooy, E. B. Lake, Howard Thorne, of Ocean City; Robert H. McCarter, of Newark; Edward Dudley, of Camden; Thomas Robb, Elwood Allen, J. D. Eberback, Emory P. Day, of Phila-

delphia; R. P. Lindermann, of South Bethlehem, and H. T. Gause, of Wilmington. The officers are given in another column.

**St. Louis, Vandalia & Terre Haute.**—The office of Mr. J. J. Turner, Vice-President and General Manager, will be moved from Terre Haute to St. Louis, July 1. H. I. Miller will be transferred from St. Louis to Terre Haute, becoming General Superintendent. Changes of superintendents have not been decided upon.

#### RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

**Atlanta, Knoxville & Northern.**—The organizers of this company, the purchasers of the Marietta & North Georgia, have secured incorporation for the company in Georgia. The charter shows that it is proposed to extend the road from Macon south to Atlanta. The principal owner of this road is Mr. H. K. McHarg, of New York, and Mr. Thomas Carmichael, of London, is also a large stockholder. The other incorporators are Charles A. Collier, Charles S. Northern, Eugene C. Spalding, Jacob Haas, William T. Spalding, Edward H. Barnes, Theodore A. Hammond, Jr., Henry L. Smith, Victor L. Smith and Alex. W. Smith, of Atlanta. It is intended to reduce the grades on the present line, to relay the line with 60-lb. rails, and eventually to extend the road beyond Knoxville to some important point north.

**Brookville.**—This company was incorporated at Harrisburg, Pa., on June 11, to build a road, 13 miles long, from a point near Brookville, Jefferson County, Pa., to a point in Polk township, also in Jefferson County. The capital stock is \$130,000. Levi Heidrich, of Brookville, Pa., is President.

**Butler & Pittsburgh.**—At a conference held in Pittsburgh Saturday between Chairman James H. Reed, President J. T. Odell and Chief Engineer T. E. House the route for this new road from the Allegheny River to a connection with the Pittsburgh, Shenango & Lake Erie at Butler was finally adopted. Bids for the construction of the road have been invited until June 30. The route as agreed to will be from Butler along the Connoquenessing River to Renfrew, along Thorn and Deer creeks to the Allegheny River at Harmarville. Here the Allegheny River will be crossed by a high steel bridge. Between this point and the Monongahela River at Bessemer the route has not definitely been decided upon. The new line will parallel the Pittsburgh & Western road from Butler to Renfrew, five miles, and will have comparatively easy grades. Up Thorn Creek the grade will be about 30 ft. to the mile. At Culmerville a tunnel 700 ft. long will be necessary. Down to Deer Creek the grade will be about 40 ft. to the mile. The lowest grade in the line will be about 12 ft. to the mile. Six viaducts will be built, crossing the creeks north of the Allegheny River, and the bridge across the Allegheny River will have a height of 125 ft. above low-water mark. The distance to Butler from the river will be about 30 miles.

**Charleston & Macon.**—The Security Construction Co., of Charleston, S. C., which is the construction company organized to build the first division of this road southwest of Charleston, has secured subscriptions to the bonds of the railroad company to the amount of \$320,000, the subscriptions being made largely by the banking interests of the city. President George A. Wagener, of the Security Construction Co., states that the sale of these bonds will enable the company to begin active construction work early in July. The contract for about 80 miles of the road from Charleston to Allendale, S. C., has been let to the firm of W. B. Strang & Co., of 15 Wall street, New York City. President Wagener states that the grading will be completed before winter. At Allendale a connection will be made with the Greenwood, Anderson & Western, formerly known as the Carolina Midland. That road is now being extended about 70 miles beyond Sevierville, its present terminus, to Greenwood, S. C. The interest controlling that line is identified with that of this new company. The object of the projectors is to build a new line to the southwest as an outlet for Charleston, and it is stated that this object will be attained by an agreement already arrived at with the owners of the Port Royal & Western Carolina road.

**Chicago, Indiana & Eastern.**—The projectors state that they expect to get this road out of its financial difficulties within a short time, having made a provisional agreement by which the company will secure enough funds to complete the first division of the road. Some work has been done on the line between Converse and Muncie, but the grading has been stopped since last Fall. The road has been surveyed from near Matthews to Richmond, Ind., about 75 miles. Fremont Wilson, of Fairmount, Ind., is Chief Engineer.

**Duluth & Winnipeg.**—The success of the Canadian Pacific interests in the litigation which has served to postpone the reorganization of this company will result in the early commencement of work on the northwestern extension of the line. Its terminus is now at Deer River, 109 miles northwest of Duluth. President Van Horne while at Duluth recently is reported to have said that a branch is to be built into Northern Minnesota to reach the Mesaba iron mining district as well as from Deer River toward the Red River across the state.

**Great Northern.**—Rumors regarding the proposed extension of what is known as the Fosston Branch across Northern Minnesota into Duluth have been revived recently. Last week a party of engineers of the Great Northern left Fosston, Minn., the present terminus of this branch, to resurvey the line through Minnesota. It is said that they are to run the line across the Mississippi River at about Bemidji Lake, near a town site of that name recently located by Samuel Hill, President of the Eastern Minnesota, and others, of St. Paul. Continuing, the line will go to the north of Leech Lake, crossing the Duluth & Winnipeg near its present terminus at Deer River. That road is built from that point into Duluth, but it is now controlled by the Canadian Pacific.

It is also said that an extension of the Halsted line north to Crookston, Minn., the eastern terminus of the Fosston Branch, will also be undertaken this year. The Halsted line runs north from Moorhead, east of the Red River, and it is said that preparations have been made to begin the grading immediately to continue this line north of Halsted. This line, like the proposed extension of the Fosston Branch, has been surveyed a number of times.

**Indiana Central.**—The work of surveying this road from Huntington to Union City, Ind., has been finished. General Manager Howe states that all arrangements have been finished to go on with the work of constructing the road between the points named.

**Kansas City, Pittsburgh & Gulf.**—Through the efforts of a committee of business men of Hot Springs, Ark., an agreement has been made with the officers of



this company by which a branch of the road will be built to Hot Springs, Ark. It is reported that the officers have agreed to commence work on this line in July, and to complete it by January, when the through main line of the road to Texas is to be opened. The point at which this Hot Springs branch will leave the main line has not yet been determined upon, but will probably be at some point on the road now being constructed in Arkansas to complete the connection between Shreveport, La., and Fort Smith, Ark.

**Lancaster & Chester.**—This company has been organized to take over the property of the Cheraw & Chester narrow gauge road recently sold at foreclosure. The line is 29 miles long from Chester to Lancaster, S. C., and will probably be changed to standard gauge. The property will be otherwise improved by the new owners and new equipment purchased. The directors of the new company are W. H. Hardin, of Chester, S. C., the Receiver, Le Roy Springs, and others, as given in this column last week under the title of Cheraw & Chester.

**Little Kanawha Valley.**—The result of the election in Wood County, W. Va., last week, on the proposition to issue \$175,000 in bonds, to aid the railroad, was a large majority in favor of the project. The projectors stated that if this subscription carried, they were prepared to begin work this summer on the first section of the road from Parkersburg up the Little Kanawha River to Palestine, a distance of 30 miles. The objective point of the road is Glenville, the county seat at Gilmer County, and about 90 miles from Parkersburg. The route is through a rich coal and lumber region of West Virginia.

**Middle Georgia & Atlantic.**—Mr. J. W. Preston, General Manager of the road, has purchased 2,000 tons of 60-lb. rails, to be laid on the Eatonton branch road, from Milledgeville to Eatonton, Ga., 21 miles. This branch road has recently been purchased by the company. It has been operated under lease for a year, since the road was surrendered to the owner by the Central of Georgia Receivers.

**Mineral Range.**—This road in Northern Michigan, a narrow gauge line from Houghton to Calumet, 15 miles, will be changed to standard gauge this month.

**Monterey & Mexican Gulf.**—J. A. Robinson and General Trevine, both former officers of the Monterey & Mexican Gulf road, have a concession for a road to the San Nicolas and San Carlos mining camp in the State of Tamaulipas, in Northern Mexico. The road will have from the start an assured tonnage from the copper camps of San Carlos and San Jose, and the high-grade lead ores of San Nicolas. Work will shortly commence from the station of Garza Valley, on the line of the Monterey & Mexican Gulf Road.

**New Roads.**—George D. Lang and S. L. Fountain, of Rosenberg, Tex., are projecting a new road to extend from that town southeast to Velasco on the coast. No attempt has yet been made to organize a company, but the projectors state that the free right of way will be easily secured and probably also valuable county subsidies. The line would be 50 miles long.

The Ward Lumber Co. has surveyed a new standard gauge road from Campbell, Mo., in Dunklin County, in Southwest Missouri, to reach a tract of about 12,000 acres of timber land owned by the company. The new road will be laid with 45-lb. rails.

John Condon, of Knoxville, Tenn., has been awarded the contract to build 27 miles of road from Rugby Road Station, on the line of the Cincinnati Southern, to Jamestown, the county seat of Fentress County in the Tennessee oil fields.

A survey has been made for a new road from Manchester, N. H., to the quarries of the New England Granite Works near that town. The road will be short, but it will include a number of branches to various quarries near Manchester. It is built to give these quarries a better outlet to the market reached at Concord, N. H.

**Northern Pacific.**—Contractors are now grading a line from Townsend, about 30 miles west of Helena, Mont., to White Sulphur Springs and Castle, in Meagher County. This work is being done by local capital, and as soon as the road has been graded the Northern Pacific will provide the rails and operate the road. The branch will have the effect of opening several gold and silver mines at Castle, which have been practically abandoned because of the wagon-haul of 60 miles to the nearest railroad station. Trains will be running over the branch by Nov. 1.

**Ocean City.**—A meeting of those interested in the building of the new line of road from Petersburg, N. J., to Ocean City, which is to be operated by the South Jersey road, was held at the office of President Francis I. Gowen, of the South Jersey, last week and a formal organization effected. The name adopted for the new corporation is the Ocean City Railroad Company. The officers are Logan M. Bullitt, President; E. P. Day, Vice-President; Thomas H. Wilson, Secretary and Treasurer. The road is now under contract and construction from a connection with the South Jersey to Ocean City.

**Omaha & St. Louis.**—Articles of incorporation of the Omaha & St. Louis Railroad Company, with a capital stock of \$2,500,000, have been filed with the Secretary of State of Missouri. The company will operate the road from Pattonsburg, Mo., to Council Bluffs, Ia., 144 miles. The incorporators are: W. E. Roosevelt, New York; A. E. Stillwell, J. McD. Trimble and E. L. Martin, of Kansas City; Francis Smith, Brooklyn; J. J. Cairnes, Theodore Gilman and others. The organization of this new company is in pursuance of the reorganization scheme for the Omaha & St. Louis line, which will bring its control under the interest building the Kansas City, Pittsburgh & Gulf.

**Pennsylvania.**—About \$36,000 was paid by the company last week for two pieces of land along the Delaware & Raritan Canal at New Brunswick, N. J., which was needed to carry out the plans for the elevation of the company's tracks through New Brunswick, N. J. This is about the last of the property disputes which have delayed the work of elevation and the company is now ready to go ahead with this work at New Brunswick.

**San Francisco & San Joaquin Valley.**—The track-laying has now been completed to Merced, Cal., 55 miles south of the northern terminus at Stockton. The construction work on this last division of the road has been delayed a good deal by the bridges, of which there are several over important rivers. It is probable that regular trains will be put on between Stockton and Merced immediately instead of waiting until the line is completed into Fresno, as first proposed. It is said that a traffic arrangement is likely to be made between the railroad company and the California Navigation Company by which the railroad will secure a through line to San Francisco by using the boats of the Navigation Company between Stockton and San Francisco.

The company is meeting with a good deal of difficulty

in securing the right of way for the division of the road south of Fresno to Bakersfield, Cal., which is proposed as the southern terminus of the road, and it is likely that the company will not undertake any construction work south of Fresno this season.

**Saratoga & Mt. McGregor.**—This company has been organized to succeed the Mt. McGregor road, extending from Saratoga Springs to Mount McGregor, N. Y., a distance of 11 miles. The capital stock is \$35,000, and the directors are H. McGonigal, C. E. Arnold, W. F. New and J. F. McIntyre, of New York City; A. J. Voyer, of Albany; H. R. Gardner, H. A. Bristol and B. Brunner, of Saratoga, and A. C. Kaufman, of Pittsfield, Mass.

**Sebasticon & Moosehead.**—William T. Davis, of Boston, has taken the contract to build the 15-mile extension of this road to Monson, Me. The extension is from Harmony north. The nine miles to Harmony from Hartland has just been built.

**Stroudsburg & Wind Gap.**—Col. John Jameson, a railroad contractor of Bloomsburg, Pa., and A. F. Baker, also a contractor, of Norristown, Pa., are interested in this project for the construction of a road in Eastern Pennsylvania from Stroudsburg southeast via Saylorburg to Wind Gap, a distance of about 10 miles. This line will shorten the distance from Philadelphia to Stroudsburg and the Delaware Water Gap region, about 26 miles. The Delaware, Lackawanna & Western reaches this region from the north, and the promoters state that they have the assurances from the officers of that company of the use of the new line as a new Philadelphia connection of the Delaware, Lackawanna & Western. That company will give about 100 cars of freight a day at Stroudsburg to the new road for delivery to Philadelphia over the Philadelphia & Reading. The Stroudsburg Board of Trade has undertaken to secure subscriptions of \$40,000 for the road.

**Tennessee Central.**—The construction work on this road in Eastern Tennessee has again been stopped by financial difficulties. Work was begun during the spring by Receiver C. O. Godfrey to complete the line into Kingston on the Tennessee River, the receiver having made arrangements in Washington for funds for adjusting the old indebtedness to finish this section of the road. The receiver, however, has not received funds as agreed upon and there are said to be nearly 1,600 men who have not received pay for their labor for long periods. One of the chief contractors, Mr. C. F. Newton, says that his unpaid claims for grading amount to about \$18,000 for work in April and \$22,000 for work in May, besides about \$44,000 of indebtedness due to him for work done before the receiver took charge.

There are two interests contending for control of the property, one represented by Mr. Godfrey, who was appointed receiver last year, and the other represented by Judge J. Baxter, of Nashville, the former President of the company. The latter interests have now brought suit to have Mr. Godfrey removed as receiver.

**Tifton & Northeastern.**—This road has now been completed to the new town of Fitzgerald in Northern Georgia and opened for regular freight and passenger traffic. The new line is an extension from the road previously operated and begins at Swan, Ga., the extension being 12 miles long to Fitzgerald.

**West Virginia Oil, Coal & Railroad Co.**—This company was incorporated in Virginia last week to build a road from Sistersville, W. Va., on the Ohio River crossing Tyler County to the Baltimore & Ohio, near Warrington, W. Va. The incorporators are Governor William A. MacCorkle, W. E. Chilton, John Baker White, and B. D. Avis, of Charleston, W. Va.; H. L. Kerr, Sistersville, W. Va.; R. H. Peck and W. R. E. Collins, of Buffalo, N. Y.; Edwin Ripley, of Sherman, N. Y.; George Gilmore, of Pittsburgh, Pa.

**West Virginia Short Line.**—An election was held in Wetzel County, W. Va., on Saturday last, to decide the question of issuing \$30,000 bonds in aid of the above-named road, to be built from New Martinsville to Clarksburg, by way of the Fishing Creek Valley. Later it is proposed to extend it to Belington, to connect with the West Virginia Central & Pittsburgh and Baltimore & Ohio. The surveys are about all completed to Clarksburg, and President T. M. Jackson says that the work will be commenced in July.

**Wheeling Bridge & Terminal Railroad.**—After litigation lasting over two years, the suit of the Terminal Co., against the Wheeling Steel & Iron Co., to condemn a right of way through its property, has been decided, and the amount of damages fixed by Commissioners at \$67,500. This is understood to be satisfactory to both companies. The land desired is only a few feet wide, and about 300 ft. long. The Terminal Co. proposes to extend its line below the Panhandle road, thus enabling it to reach a large amount of freight in lower Benbow, where there are several large iron and steel works.

#### Electric Railroad Construction.

**Alexandria, Va.**—The Washington, Alexandria & Mount Vernon Electric Railroad is nearly completed, and, with the Arlington branch, comprises 21¼ miles of track. The whole line is laid with standard rails and ballasted with broken stone. There are double feed wires, double trolley wires, double trolley poles, two power houses, each doubly equipped with generators, etc.

**Baltimore, Md.**—The ordinance granting a franchise to the Falls Road Electric Railway Co. was approved May 11. The route, directors, and the estimated cost of the road were given in the Railroad Gazette of May 22.

**Bellaire, O.**—Right of way is being obtained for the new electric railway to be built between Columbus, O., this town and Wheeling, W. Va., through Belmont County. The proposed road will connect with the Bellaire, Bridgeport & Martins Ferry Electric road at Bridgeport, O., with the Columbus electric line two miles west of Bridgeport.

**Elizabeth, N. J.**—Bids are being secured by the Elizabeth Street Railway Co. for the work of laying new tracks, etc., for the changing of the horse-car line into an electric road. It is estimated that it will cost \$100,000 to make the change. The line will connect Elizabeth with the new Staten Island ferry.

**Hempstead, L. I.**—The Long Island Electric Railroad on June 10 was granted a franchise to extend its electric lines as far as Hempstead. A double track will be laid as far as Queens, and a single track from thence to Hempstead.

**Houston, Tex.**—A company is being organized to build an electric road between Houston and Galveston, across the bay wagon-road bridge, thence along the public highway to the county line, and then connect with a similar line from Houston.

**Marion, Ind.**—Work has been begun on the Clodfetter Electric Railroad, to run from Marion to Anderson, a distance of about 30 miles. A branch line to touch Elwood will leave the main road between Alexandria and Summitville.

**New Philadelphia, O.**—The grading for the electric street-car line between this town and Uhrichsville, 10 miles southeast, has been commenced. The road will probably be finished by September.

**Parkersburg, W. Va.**—The City Council on Thursday of last week granted the Park City Street Railway Co., an extension to July 1, to begin the work of changing from horses to electric power. The company has given bond to begin the work, and will extend the road.

**Plainfield, N. J.**—It is stated that the Plainfield Street Railway Co. has made a new contract with the Plainfield Electric Light Co. to furnish power for the road for 10 years.

**Philadelphia.**—The Bristol & Philadelphia Railway Co. has secured nearly the entire right of way for its new line of nine miles out on the Bristol turnpike between Poquessing Creek, which forms the boundary of the city, and Bristol. The power station is being erected at Croyden, on Nesheaminy Creek, and it is to have two engines and generators of 400 H. P. each. The General Electric Co. will furnish the generators, motors and other electrical equipment. Col. Edward Morrell is President.

The Wayne avenue line of the Union Traction Co., which at present has its terminus at Washington lane, is being extended to Johnson street, crossing the new bridge over the Chestnut Hill branch of the Pennsylvania Railroad.

The work of constructing the road on the Bristol turnpike for the Holmesburg, Tacony & Frankford Electric Railway, between Poquessing Creek and Bristol, has been begun.

**St. Louis, Mo.**—The St. Louis County Street Railroad Co. filed a petition on June 8, asking for a franchise to construct an electric road from the present terminus of the St. Louis County Street Railroad, at the intersection of Lucas and Hunt avenues and Natural Bridge road, westward on the latter thoroughfare to Florissant road, and thence northward on Florissant road to the limits of Ferguson, in all a distance of three miles.

**South Bethlehem, Pa.**—It is reported that the suit between the borough and Lehigh Valley Traction Company will be settled by the latter agreeing to extend its lines to Freemansburg or Hellertown.

**Waterbury, Conn.**—The Waterbury Traction Co. will begin at once operations for extensions of its lines in the city of Waterbury.

**Wheeling, W. Va.**—The Wheeling & Suburban Railway Co., incorporated a few weeks ago, for the purpose of building an electric road to extend the Wheeling & Elm Grove Railroad from Elm Grove to Tridelfia, a distance of three miles, has received a right of way over the National road from Tridelfia to the Pennsylvania State line at West Alexander.

#### GENERAL RAILROAD NEWS.

**Boston Terminal.**—The formal organization of this company, which has been formed to build the proposed southern Union station in Boston, has been effected by the election of President Bliss, of the Boston & Albany, as President of the Terminal Company, and Mr. J. W. Perkins, a Director of the New England, as Secretary. The act of the legislature incorporating the company, which was signed by Governor Wolcott last week, has been formally accepted.

The stockholding companies have elected the following representatives on the Board of Trustees of the Terminal Co.: New Haven, Charles P. Clark; Old Colony, Charles L. Lovering; Boston & Providence, Royal C. Taft; Boston & Albany, Samuel Hoar, and New England, F. L. Higginson. Work on the new station is to be pushed. The New England trains will go into the Old Colony Kneeland street station about July 1. The New England general offices in the New England building on Sumner street are not to be changed at present. The city will be able at once to commence the extension of the necessary streets. The City Council will undoubtedly authorize the City Treasurer to issue \$300,000 bonds to provide the money necessary to be spent this year. But in case they do not do this within 30 days, the Mayor under the act has the power to authorize the City Treasurer to issue five-year bonds outside the debt limit, and he will take advantage of this authority.

**Calumet & Blue Island.**—This company, one of the lines at Chicago controlled by the Illinois Steel Co., is to issue \$2,010,000 six per cent. bonds to retire the present bond issue of \$1,310,000, and to build a line from South Chicago to Clark's Junction, Ind., which will take the remaining \$700,000. The mortgage provides for an issue of \$2,510,000, leaving \$500,000 in reserve for extensions and improvements.

**Cincinnati Southern.**—The sinking fund trustees of Cincinnati have accepted a bid of \$19,000,000 for the sale of this railroad. The bidders are A. B. Andrews, Vice-President of the Southern Railway, and H. A. Taylor, of the Cincinnati, Hamilton & Dayton. They agree to pay the present rental of \$240,000 a year until 1902, after which date they agree to pay the city 10 per cent. on gross earnings of the road in excess of \$4,500,000 a year until 1906, when they can purchase the road outright for \$19,000,000.

**Duluth & Winnipeg.**—The Court of Appeals of Minnesota has decided the litigation involving the bonds of this company in favor of the Canadian Pacific and the trustees of the bonds. The decision was announced in the suit brought by the Attorney-General of Minnesota alleging the irregular issue of the company's bonds and making charges of collusion between President Van Horne, of the Canadian Pacific, and the trustees of the bonds. The decree of the court exonerates Mr. Van Horne from all the charges made in the suit. The suits of the contractors had been previously dismissed and with this decision the immediate foreclosure becomes possible.

**Frederick & Pennsylvania.**—Representatives of the Pennsylvania Railroad have purchased this road at foreclosure for \$150,000. It is a 28 mile branch in Maryland which connects with the Pennsylvania system at Kingsdale, Pa. It was built in 1868 and soon after leased to the Pennsylvania.

**Grand Rapids & Indiana.**—This road was sold at foreclosure at Grand Rapids, Mich., on June 10 under the decree issued by the United States Court in the suit



brought under the second mortgage bonds, the majority of which are held by the Pennsylvania road. The property was sold subject to the first mortgage of \$6,000,000 and was purchased by representatives of the Pennsylvania for \$500,000. There is a third mortgage of about \$4,000,000. The property sold was exclusive of the Muskegon Branch and the land grant.

**Illinois Central.**—The financial statement for the first ten months of the fiscal year, which includes the month of April, shows an increase in gross earnings as compared with the ten months ending April 30, 1895, of nearly \$2,000,000. Operating expenses and taxes also increased, leaving the net earnings for the last ten months \$6,004,372, an increase, as compared with the corresponding period of the last fiscal year, of \$1,234,778. The principal figures of the report are given below:

	1896.	1895.	Increase.
Gross earn.....	\$17,872,524	\$15,896,234	\$1,976,290
Oper. exp. and taxes.....	11,868,152	11,116,610	751,542
Net earn.....	\$6,004,372	\$4,779,594	\$1,224,778

The report for May, however, shows an estimated decrease of \$64,706. Gross receipts for last month were \$1,587,126, as compared with \$1,651,832 for May, 1895.

**Jacksonville, Louisville & St. Louis.**—This road, extending between Jacksonville and Mount Vernon, Ill., was sold here at Jacksonville, Ill., on June 11, under a decree of the Federal Court of Southern Illinois in foreclosure proceedings. Robert F. Kennedy and J. Henry Dunn, of Philadelphia, Purchasing Committee of the Finance Company of Pennsylvania, the bondholders of the road, were the only bidders.

**Jacksonville, Tampa & Key West.**—The annual report of Receiver Durkee, for the year ending March 31, 1896, says that the amount of receiver's certificates was increased to \$116,300, but there was paid in the year \$64,920 arrears of interest on underlying bonds. All equipment trust obligations except \$8,000 were discharged. The gross earnings of the company for the year were \$917,278, against \$668,782 the year previous; and there was a deficit of \$5,667 in meeting operating expenses against net earnings of \$200,428 in 1894. The receiver's certificates sold realized \$67,954, so that there were net cash receipts for the year of \$62,287. The freight ton mileage was 6,365,240, against 21,483,985; and the rate per ton per mile was 2.17 cents, against 1.88 cents. The number of passengers carried one mile was 4,303,445, against 6,445,871; and the average rate per passenger per mile was 2.63 cents, against 2.78 cents. The effects of the great freeze of the winter of 1895 are still keenly felt in the earnings of the road; but the receiver has been able to maintain the physical condition of the property. On Dec. 27, 1895, a decree in foreclosure was made in the Circuit Court of the United States for the Southern District of Florida and under this decree the property was advertised to be sold on April 6, 1896. This sale was continued at the request of complainants to May 4, 1896, and again continued by a like request to Nov. 2, 1896.

**Midland Terminal.**—For more than a month the Midland Terminal has been standing out against Receiver Ristine, of the Colorado Midland, upon the question of a division of percentage on freight earnings. The original contract granting the Midland Terminal one-third of the through charges between Denver and Cripple Creek camp expired May 1, and Receiver Ristine decided to offer but one-fourth hereafter. Pending a settlement of this question all freight in and out is billed only to Divide, the connection point, where it is re-billed and forwarded. This results in such great inconvenience to shippers that the bulk of the business is now routed via the Florence & Cripple Creek. The Midland Terminal can scarcely do business at the rate offered and is holding out hoping to secure concessions from the Colorado Midland, but as the contract under which Receiver Ristine manages the Colorado Midland gives him full and independent power in rate making, there seems to be no hope for the Terminal.

**New York Central & Hudson River.**—For the month of May, 1896, gross earnings are reported as \$3,704,680, an increase of \$96,614.

**New York & Sea Beach.**—The property of the company was sold under foreclosure proceedings in Brooklyn on June 11. The mortgage is for \$300,000, but the property was sold for \$250,000, and was purchased by William Mann.

**Northern Pacific.**—The Receivers report the earnings for April as follows:

	1896.	1895.	1894.
Gross earn.....	\$1,284,439	\$1,307,734	\$974,285
Oper. exp.....	909,661	848,820	712,662
Net earn.....	\$374,778	\$458,914	\$261,623
P. c. exp. to g. earn.....	70%	64%	73%
Other income.....	77,177	123,730	1,294
Balance.....	\$152,009	\$382,615	\$262,917
Charges assumed.....	576,243	523,992	457,428
Deficit.....	\$124,234 (Sur.)	\$59,253 (Def.)	\$194,511
Charges not assumed.....	391,467	447,173	475,864
Deficit.....	\$515,701	\$387,920	\$668,375

For 10 months:

	1896.	1895.	Inc.
Gross earn.....	\$16,907,279	\$14,839,332	\$2,067,946
Net earn.....	7,321,701	5,452,528	1,870,172

**Pittsburgh & Western.**—It is stated that \$250,000 of receiver's certificates have been issued out of the \$500,000 authorized, and that the floating debt of the company is secured principally by second mortgage bonds. United States Express Company's stock and Fairmount, Morgantown & Pittsburgh first mortgage 4½ per cent. bonds. These latter bonds were never sold to the public. The total issue is \$3,000,000, and has, it is said, been used entirely as collateral for floating debt.

**St. Louis & San Francisco.**—The Reorganization Committee has settled with the bondholders of the St. Louis, Salem & Arkansas road. The latter will receive 50 per cent. in consolidated bonds, 40 per cent. in preferred stock, and 60 per cent. in common stock of the new company, which is to be called the St. Louis & San Francisco Railroad Company.

**Union Pacific.**—The Receivers report earnings for April as follows:

UNION PACIFIC SYSTEM.			
	1896.	1895.	1894.
Gross earn.....	\$1,652,416	\$1,664,763	\$1,839,082
Oper. expen., excl. taxes.....	1,030,283	1,085,820	1,365,390
Net earn.....	\$622,132	\$578,943	\$473,692
P. c. exp. to earn.....	62%	63%	74%
Net four months.....	2,233,204	1,900,341	1,865,291
ORION SHORT LINE (UTAH NORTHERN).			
Gross earn.....	\$144,789	\$389,649	\$439,389
Oper. expen., excl. taxes.....	210,594	250,028	303,086
Net earn.....	\$234,175	\$169,621	\$136,303
Net four months.....	772,261	438,681	469,223

ST. JOSEPH & GRAND ISLAND.			
Gross earn.....	\$53,244	\$44,914	\$72,741
Oper. expen., excl. taxes.....	39,400	37,805	50,683
Net earn.....	\$13,835	\$7,309	\$22,048
Net four months.....	38,960	36,874	91,880

**Union Pacific, Denver & Gulf.**—Receiver Trumbull has decided to call in \$75,000 of receiver's certificates, to be paid off from the earnings of the road. Traffic on all the branches of the company is now good, the freight and passenger business on the mountain lines being especially large. The line from Denver to Greeley along the foothills and passing through a cultivated district with prosperous towns has a steadily increasing local trade which is highly remunerative. The mining boom has greatly increased the business of the old Colorado Central branch, while the betterments made on the main line south have improved earnings along that route.

**West Jersey & Seashore.**—The stockholders of this new company, which has been organized to take over the property of all the South Jersey lines of the Pennsylvania, at a special meeting this week authorized the directors to issue a first consolidated mortgage for \$7,000,000 to take the place of the bonds of the merged roads. The bonds to be issued will bear four per cent. interest. The mortgage provides that sufficient bonds be reserved to take up bonds which may mature from 1898 to 1912. The balance of the money obtained from the sale of the bonds is to be applied to capital expenditures as may be required. There are at present outstanding \$4,500,000 bonds of the company, of which over \$900,000 can be paid at once. All the outstanding bonds pay interest ranging from five to six per cent. per annum.

#### Electric Railroad News.

**Brooklyn, N. Y.**—The gross receipts of the Brooklyn Heights Railway Co. for the 11 months ending May 31 were \$4,022,016.25, an increase of \$277,419.04 over the corresponding period last year.

**Langhorne, Pa.**—The stockholders of the Langhorne Trolley Co. have voted to increase the capital stock of the company from \$20,000 to \$100,000.

**New York.**—The directors of the New York & Harlem Railroad Company have formally authorized the lease of the Fourth Avenue horse-car line to the Metropolitan Street Railway Co. The stockholders will hold a special meeting on July 15 to ratify the lease. Under the terms of the lease, which is for 999 years from July 1, the Metropolitan Street Railway Co. will pay an annual rental, exclusive of taxes, of \$350,000, equivalent to 3½ per cent. on the capital stock of this company, for the first five years, and of \$400,000, equivalent to 4 per cent. on such capital, thereafter. Mechanical power will be used on the line, but the type of motor has not yet been decided on.

**Norfolk, Va.**—The Norfolk Electric Light & Power Co., recently incorporated, includes among its plans the construction of an electric street railroad at Norfolk. The officers are: President, S. B. Laurence; Vice-President, R. A. Dibble; Secretary and Treasurer, J. B. Summerfield, who, together with J. W. Wilcox and O. F. Smith, contribute the Board of Directors.

**Salisbury, N. C.**—W. J. Murdock, President of the Salisbury Cotton Mills, who recently bought a charter issued last month, to build and equip an electric railroad from Salisbury to the new machine shops of the Southern Railway, five miles west of Salisbury, states that the work of construction will begin next month. In the meantime he is to go North to purchase material and equipment.

**San Francisco, Cal.**—The San Francisco & San Mateo Electric Railway Co. has been formed with a capital stock of \$1,000,000 for the purpose of purchasing and operating the San Francisco & San Mateo Street Railroad.

**Toledo, O.**—Blair & Co., of New York, who purchased the lines of the Toledo Electric Street Railway about May 1, have consolidated with the Toledo Traction Co., the chief owners of which are W. F. Hale and N. B. Ream, of Chicago. It is said that a new company, with a capital stock of \$5,000,000, will be organized.

**Victoria, B. C.**—The Consolidated Electric Railway Co. has purchased the electric roads in Victoria, which were recently sold at auction. The company is an English syndicate, and now owns the electric roads at Nanaimo, Vancouver, New Westminster and Victoria.

#### TRAFFIC.

##### Traffic Notes.

The receivers of the Norfolk & Western, after considerable correspondence and conference, seem to have decided not to join the Joint Traffic Association.

The Managers of the Joint Traffic Association have approved a rule fixing the regular charge for special cars at 18 full first-class limited fares for the distance traveled, and for each person carried in addition to that number one full fare is to be charged.

The Philadelphia Car Service Association handled during the month of May 93,969 cars, a falling off of 11 per cent. from the corresponding month of 1895. For the nine months ending May 31 the increase over the same months of the previous year was 6.4 per cent.

The Southern States Freight Association held its annual meeting last week and elected the following officers: President, J. W. Thomas, Nashville, Chattanooga & St. Louis; Vice-President, R. G. Erwin, Plant system; Commissioner, H. S. Haines; Secretary, J. H. McGill.

The New Haven Steamboat Line now runs special excursions between New York and New Haven every Sunday. The Richard Peck leaves New York at 9:30 a. m., arriving in New Haven at 1:45 p. m., and the return trip is made on the C. H. Northam, leaving New Haven at 3 p. m., reaching New York at 7:30. The fare for the round trip is \$1.

Western papers report that the Pennsylvania has asked the Managers of the Joint Traffic Association to authorize a reduction of \$2 in the first-class fare between New York and Chicago, over the Panhandle route, and \$1 on second class. This is the first time within the memory of the oldest inhabitant that the Pennsylvania has asked for a differential, and the reporters are filled with wonder. It appears that the recent ruling of the Board of Managers allowing weaker lines the benefit of their differentials on excursions as well as upon regular passenger business, is felt to be a considerable detriment to the strong lines; and this application of the Pennsylvania seems to have been prompted by this change in the status of the excursion business.

#### Interstate Commerce Commission.

The Commission has issued a decision prepared by Chairman Morrison in the case of the Jerome Hill Cotton Company against the Missouri, Kansas & Texas. The following are the head notes of the decision:

"1. A higher charge for a shorter than for a longer distance is sought to be justified by the existence of a compress at the longer-distance point where cotton may be compressed and shipped thence to destination at less expense than cotton from the shorter distance can be hauled to the longer-distance point, there compressed, and hauled to destination or, as is claimed, at less cost than it can be hauled to destination directly without compressing. The rate-sheet in such cases fixes a rate of charges from the shorter and longer-distance points on flat or uncompressed cotton only, 'with option of compression en route.' In some cases the carrier avails itself of this option and has the shorter-distance cotton compressed, hauling it to the longer-distance point without compressing, the charge to the shipper being the same in either case. Held, That when under this option system of rate making the carrier causes cotton to be compressed at its own cost and for its own benefit, any dissimilarity of circumstances resulting therefrom is of the carrier's own making, and does not take the traffic out of the general rule of the statute which forbids a greater charge for a shorter distance.

"2. Where a carrier charges 70 and 80 cents per 100 lbs. on cotton from Indian Territory points to St. Louis and 75 cents for distances 400 to 600 miles longer, and had long had in force rates of 60 and 65 cents, per 100 lbs. from these Indian Territory points when it did not reach St. Louis over its own line, and at a time when the value of cotton was much higher and its transportation more expensive than now; when it had made considerable reductions in its rates and charges generally, and upon 99 per cent. or practically all its cotton rates except those in dispute, and when its rate on other freight, hauled and handled at greater expense, is much less than cotton rates, and where other roads in the same territory for like rates have much longer hauls. Held, That such charges of 70 and 80 cents are unreasonable and to be reasonable should not exceed 60 and 65 cents per 100 lbs.

"3. The financial necessities and conditions of the carrier should be considered and given proper weight in fixing rates, but are not controlling to the extent that independent of other circumstances any rates are reasonable until the earnings are sufficient to operate the road and meet all the obligations of the company. The stated obligations of the carriers between St. Louis and Texas, and St. Louis and the Indian Territory, to be met by earnings, are eight times as great on some as upon others, varying from less than \$13,000 to more than \$103,000 per mile; and to adjust reasonable rates on the basis of the bonds and stocks issued is impracticable."

The complaint in this case was filed in October, 1894. It appears that the rates on cotton to St. Louis from non-competitive points in Indian Territory were very much higher than from competitive points, and higher, per mile, than from similarly situated shipping points on the St. Louis & San Francisco and the Rock Island. The Missouri, Kansas & Texas is now able to haul freight trains of 1,000 tons where it hauled only 550 a few years ago, and in view of the decreased cost of hauling, the road had made important reductions on 99 per cent of the cotton carried by it.

#### Chicago Traffic Matters.

CHICAGO, June 17, 1896.

The sensation of the week in Chicago was the discovery of the existence of two reduced rate tariffs which seem to have been issued on the fly. On June 8 the Baltimore & Ohio issued an 8-cent tariff on grain to Cleveland, 2 cents below the agreed rate, and it is said that it was given to only one Board of Trade firm. This tariff was not discovered for several days after it went into effect, by which time the Baltimore & Ohio had contracted 150 cars of grain at the rate. On the same date the Erie reduced the oil rate from the Oil City district to Chicago and nobody found it out for some time. When the facts concerning these tariffs were published in a Chicago newspaper, a meeting of the Chicago Eastbound Freight Committee was held. Both roads acknowledged the existence of the tariffs and agreed to withdraw them June 24. The Lake Shore and the Nickel Plate were the only lines that met the Baltimore & Ohio's grain rate. There is a bitter local feeling against the two roads for secretly violating the Central Freight Committee's agreement.

Chairman Midgley, of the Western Freight Association, has been advised by the Board of Managers of the Joint Traffic Association, that the roads east of Chicago will not be authorized to help the Chicago-St. Paul lines to meet the 44-cent rate of the Canadian Pacific on wool to Boston. It is said that the Canadian Pacific has already contracted for 300 cars of wool. Several of the eastbound roads are in favor of accepting 30 cents east of Chicago, but they will not join in such a tariff without authority from the Board of Managers.

The Board of Managers has approved of the running of Niagara Falls excursions from Central Passenger Committee territory. The rates in each instance are 100 per cent. higher than last season. The dates agreed upon for the excursions of the different roads are as follows: Big Four, July 22; Cincinnati, Hamilton & Dayton, Aug. 5; Erie, Aug. 19; Pennsylvania, Sept. 2; The Lake Erie & Western date is to be fixed later.

Total shipments to the East by lake last week amounted to 76,349 tons, of which 69,273 tons were grain. Total all-rail shipments, exclusive of live stock, for the week amounted to 62,302 tons, compared with 64,108 tons for the preceding week, a decrease of 1,906 tons, and against 45,786 tons for the corresponding week of last year. The proportions carried by each road were as follows:

Roads.	WEEK TO JUNE 14.		WEEK TO JUNE 7.	
	Tons.	p. c.	Tons.	p. c.
Michigan Central.....	6,043	9.7	6,074	9.4
Wabash.....	7,423	11.9	6,883	10.7
Lake Shore & Mich. South.....	8,799	14.2	9,317	14.5
Pitts., Ft. Wayne & Chicago.....	7,304	11.7	7,962	12.4
Pitts., Cin., Chi. & St. Louis.....	6,023	9.7	7,937	12.4
Baltimore & Ohio.....	4,971	8.	4,729	7.4
Chicago & Grand Trunk.....	5,978	9.6	7,283	11.4
New York, Chic. & St. Louis.....	6,053	9.7	6,214	9.8
Erie.....	6,810	11.	5,017	7.8
C., C., & St. Louis.....	2,798	4.5	2,662	4.2
Totals.....	62,202	100.0	64,108	100.0

Of the above shipments 2,640 tons were flour, 26,353 tons grain, 12,290 tons provisions, 10,652 tons dressed beef, 2,248 tons butter, 1,149 tons hides, and 4,618 tons lumber.